

THE MALAYAN JOURNAL  
OF  
TROPICAL GEOGRAPHY

VOLUME SIX  
OCTOBER 1955

PADI LANDSCAPES OF MALAYA

*By*

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AND OTHERS

*Printed with a grant from the Shell Company  
of the Federation of Malaya, Limited*

PUBLISHED BY THE DEPARTMENT OF GEOGRAPHY  
UNIVERSITY OF MALAYA, SINGAPORE

ERRATA

*Page ii*

Part IV—Chapters II and III for “Pages 55 and 58” read  
“Pages 65 and 68”.

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## A GLOSSARY OF MALAY TERMS USED IN THE TEXT

*The scientific terms for Malay tree-names are incorporated in the text*

<i>Atap</i>	— roofing-thatch.
<i>bagan</i>	— landing-place.
<i>batas</i>	— boundary-dyke to a padi-field.
<i>bēkas</i>	— a wooden box with a capacity of up to $1\frac{1}{2}$ <i>kunchahs</i> , generally for storing glutinous rice.
<i>bēlukar</i>	— secondary jungle; scrub.
<i>bēndang</i>	— irrigated padi-fields.
<i>bērdērau</i>	— co-operative work in the padi-fields.
<i>bukit</i>	— hill.
<i>changkul</i>	— hoe for digging and breaking up earth.
<i>gunong</i>	— mountain.
<i>jēlapang</i>	— rice-barn raised on posts.
<i>kampong</i>	— cluster of buildings making up a large homestead or a small hamlet, and including the surrounding mixed gardens.
<i>kētam</i>	— a harvesting instrument.
<i>kētua</i>	— elder; headman.
<i>kērēbong</i>	— a cylindrical, plaited-bamboo bin used for sorting padi.
<i>kuku kambing</i>	— forked stick for planting seedlings in wet soil.
<i>lēsong</i>	— a mortar for pounding rice.
<i>mēnabor</i>	— the initial sowing of padi.
<i>mēnyulam</i>	— the replacing of dead padi-sprouts about ten days after planting.
<i>mērēdeh</i>	— the shifting of padi seedlings from the primary to the secondary seed-bed.
<i>mukim</i>	— territorial subdivision for purposes of land revenue.
<i>ngolok</i>	— buffalo-drawn roller.
<i>padi</i>	— rice (i) as a plant (ii) in the ear and (iii) as unhusked grain.
<i>padi kuncha</i>	— a Malay system of credit. See p. 5.
<i>parit</i>	— ditch or open drain.
<i>parit buang</i>	— a drain.
<i>parit masok ayer</i>	— a distributary canal.
<i>pēnghūlu</i>	— headman.
<i>pērmatang</i>	— bank, rising ground.
<i>pisau sabit</i>	— harvesting sickle.
<i>pukat</i>	— a generic name for large nets (especially drift-nets and seines).
<i>pulut</i>	— glutinous rice.

<i>rumput</i>	= grass; weeds.
<i>sungei</i>	= river.
<i>surau</i>	= a private mosque in contradistinction to a mosque of general assembly.
<i>sēmai rakit</i>	= floating seed-bed.
<i>sēmai tapak</i>	= seed-bed.
<i>tajak</i>	= grass-cutter (resembling a short-handled golf-club).
<i>tēngēring</i>	= a buffalow-drawn roller.
<i>tērendak</i>	= a conical sun-hat.
<i>zakat</i>	= poor-rate; "a tithe levied once a year after the Fasting Month for distribution among indigent servants of Allah."

The principal local measures of weight, capacity and area, together with their English equivalents, are as follows:—

The <i>chupak</i>	= 1 quart.
The <i>gantang</i>	= 1 gallon.
The <i>tahil</i>	= $1\frac{1}{2}$ oz.
The <i>kati</i> (16 <i>tahils</i> )	= $1\frac{1}{2}$ lb.
The <i>pikul</i> (100 <i>katis</i> )	= $133\frac{1}{3}$ lb.
The <i>koyan</i> (40 <i>pikuls</i> )	= 5,333 $\frac{1}{3}$ lb.
One <i>jēmba</i>	= 64 square feet.
One <i>rēlong</i>	= 484 <i>jēmbas</i> .
One <i>acre</i>	= 1.40625 <i>rēlongs</i> .

Other weights in common use are:—

10 <i>huns</i>	= 1 <i>chi</i> .
10 <i>chi</i>	= 1 <i>tahil</i> ( $1\frac{1}{2}$ oz.).
1 <i>bahara</i> (3 <i>pikuls</i> )	= 400 lb.
1 <i>kuncha</i>	= 160 <i>gantangs</i> .
1 <i>nalih</i>	= 16 <i>gantangs</i> .
1 <i>gantang</i> of <i>padi</i>	= 5 lb. approximately.
1 <i>gantang</i> of rice (milled)	= 8 lb. approximately.

PART ONE

**FIELD STUDIES IN THE PADI-LANDS OF MALAYA**



## FIELD STUDIES IN THE PADI-LANDS OF MALAYA

PADI CULTIVATION is periodically a matter of public worry in the Federation of Malaya. Interest has always been high at the slightest sign of a depression in the prices of tin and rubber and also when the possibility of war in the Far East has threatened to endanger that supply of imported rice upon which the urban, estate and mining populations of Malaya depend. There has been a further quickening of interest when for internal political reasons it has been necessary either to obtain the goodwill of the Malay community, which predominates in padi-growing areas, or to neutralize the non-Malay communities. The advent of state and federal elections has now vested the subject with a new importance as a means of vote catching.

### THE RICE PRODUCTION COMMITTEE

It was in this context that the Government of the Federation of Malaya, alarmed by the long-continuing scarcity of rice on the international market and by the downward trend of rubber and tin prices, in 1952 convened a Committee "to consider ways and means whereby the acreage planted under padi in the Federation and the yield per acre can be materially increased within the next three years." The Committee's Report<sup>1</sup> was published in mid-1953 and proved to be a useful collation of existing internal information and opinion on conditions among padi-growers, though it delicately sidestepped ill-defined issues of domestic sensitivities.

There was nothing particularly original about the reasons adduced by the Report for the decline of padi production in Malaya following the fever of post-war rural rehabilitation, which passed its peak in 1949. The attraction of work on commercial crops (rubber, palm-oil, etc.), the disruption of normal life while a fifth of the total population was resettled into new villages defended from Communist attack, the shortage of technical staff to maintain and extend irrigation, drainage and agricultural services, the flight to employment in towns and in mines, and the intensive recruitment of young Malays into the police and armed services of the country—all these factors have played a part in the decline of interest in padi-farming among Malays, for whom it has always been a way of life rather than an economic activity.

Increasing charges by landlords were quoted by the Report as a factor but the evidence was not conclusive and, as presented, left the impression of being hearsay and a repercussion of that political propaganda which paradoxically alleges that landlords are "bad things" while at the same time claiming that everyone should own a stake in the land.

Its enquiries led the Committee beyond farming into the complex circumstances connected with getting padi out of the fields and into trade. The Report proved remarkable in this respect for the number of questions it raised and the answers it could not provide. The Committee, with all the resources of government agencies at its disposal, uncovered great ignorance about the state of affairs among padi-growers. It cast doubts on the validity of those agricultural statistics accumulated in the Federation over many years. It found no firm data about ownership of padi-lands, the size of holdings, or the whereabouts of landlords. It could not accurately estimate the yield of fields, the

1. *Report of the Rice Production Committee* (Kuala Lumpur, 1953), pp. 158.

intensity of cultivation or the amount of padi consumed by the peasants. It was unable to gauge the extent of the Malay flight from the land or the degree of penetration into padi-lands by immigrant communities from China and India.

### THE SCHEME OF FIELD STUDIES

In an attempt to fill in the great factual gaps thus made evident, the Geography Department of the University of Malaya offered to send its members into selected padi-growing localities to carry out micro-geographic studies and obtain basic material upon which government agencies might with greater confidence frame their policies and found their schemes for rural development. The idea was proposed at a meeting with the Federal Member for Natural Resources (then Dr. Ismail bin Dato' Abdul Rahman) in January 1954, when the need for detailed fact-finding surveys as a preliminary to planning was put by Professor E.H.G. Dobby and supported by the Director of Agriculture. At that meeting it was agreed that the function of University workers in this respect was to obtain materials rather than to enunciate problems or suggest solutions. It was decided that the Geography Department should conduct in successive years exhaustive field-by-field surveys in selected padi-growing mukim (or parishes), for the purpose of investigating land classification, land utilization, land ownership in relation to houses and to communities, estimates of crops, crop-sharing systems, population in relation to crops, and movements of crops after harvest. Using a grant from the *Colonial Development and Welfare Fund* to cover their costs of living, sixteen young Asians and their tutors volunteered to give their long vacation of 1954 to this work, which by its nature was arduous, unspectacular and complex. They spent June, July and August in the field and September in processing their materials into those appreciations or reports which are given here as Parts II, III and IV.

The areas chosen, in consultation with the Director of Agriculture, for the field-by-field investigation were Krian in Perak, Mukim Four Central in Province Wellesley, and Mukim Dulang in the North Kedah Plain. These places are located at intervals of roughly thirty miles along the lowlands of North-West Malaya which form the chief rice-bowl of the Peninsula (Plate 1). Reasons for choosing these particular areas included the interest attaching to the situations in (1) a fifty-year-old, engineered scheme for settling padi-farmers (Krian); (2) a locality which, although colonially administered for over a century, had yet evolved by indigenous trial-and-error methods (Mukim Four Central); and (3) an isolated patch of swamp-land, cleared by local inhabitants whose administrative associations with Western technicians date only from 1909 (Dulang).

The following Asian university men went to the three localities: Saw Huat-lye (Perak Hokkien), Tan Soo-hai (Penang Hokkien), George Seow (Singapore Hokkien), Mohd. Yunus b. Hanifah (Perak Malay), Lokman b. Musa (Johore Banjarese), R. P. Jegaraj (Perak Tamil Indian) to Krian; Hamzah b. Sendut, Hashim b. Aman (Negri Sembilan Malays), Shim Kah-foo (Johore Hakka), Lam Kok-hon (Malacca Cantonese), Soh Kai-choo (Perak Hokkien) to Mukim Four Central; Osman b. S. Cassim (Perak Malay), Victor Gopal (Penang Sino-Indian), Victor de Bruyne (Penang Eurasian), Murad b. Mohd. Noor (Kedah Malay), Peter Wee (Singapore Hokkien) to Dulang. The mixture of communities represented in these teams at once reflects the constitution of the University of Malaya student body and the need for a wide range of dialects and languages if field-workers are to interrogate adequately even in rural areas conventionally described as "predominantly Malay". All the men spoke Malay in addition to being educated in English and speaking other vernacular languages.

It was a necessary adjunct of the scheme that each team lived within the mukim it was investigating. To that extent the workers faced the difficulties of supplies, lack of amenities and the health risks which are part of the padi-growing environment. They worked by courtesy of local people and had no official right to use their time or command their attention. They were introduced to local headmen (*penghulus*) but had to work out their own *modus vivendi* among the peculiarities and conventions of the peasants.

All the investigation was under the direction of the Professor of Geography in the University of Malaya, who visited the teams twice during their field-work. Mr. B. W. Hodder supervised the first entry of the groups into the field and also the processing of materials and preparation of reports by the teams.

### THE TECHNIQUE EMPLOYED

The work was divided into four phases: (1) mapping the evidence apparent in the landscape; (2) questioning the households; (3) examining the Land Register; (4) processing the materials obtained.

(1) *Mapping.* Each team was supplied with copies of the lot-map of its area. On these maps the lots are represented on a scale of 8 chains to an inch (1:6,336) as recorded in the last "survey for title" prepared by the Federal Survey Department. The map shows only the geometric pattern of the surveyed outlines of the properties, which are numbered according to the entry in the *Mukim Register of Land Titles*. With this as base the teams inserted the following details, drawn to scale and placed in relation to the stones which on the ground mark the lot boundaries:—

- (i) the houses (numbered by the team); paths, roads and canals; each well and the group of houses using it; the streams, canals and drains; padi-mills; position of water-pipes and stand-pipes; *jelapang* (buildings used as padi-stores), threshing-floors, seed-beds;
- (ii) the land use classified as *kampong* (mixed trees and shrubs round a house), padi, orchard (fruits and *areca* palms), rubber, coconuts, residences without production, vegetable gardens, retail shops, public buildings (schools, mosques), unused cultivable land, swamp vegetation (*nipah*, mangrove), padi- and rubber-dealing shops;
- (iii) the texture and colour of the soil and the slope of the ground;
- (iv) by enquiry, fields where water usually lies longer than elsewhere in the mukim; fields where double crops of padi are obtained; padi-fields which have remained uncultivated for at least three years; fields where padi suffers from lack of water;
- (v) at a later stage in the survey and after the interrogation of households, upon each lot was inserted the house-marks of the owner, of the man who worked it, and of anyone with whom its crop was shared;
- (vi) supplementary to the mappable facts, the teams took sample traffic counts at selected points, in order to obtain data relating to the movement of people.

(2) *Questioning.* Appendix II is the pro forma questionnaire used by each team in house-to-house visits over the whole of its surveyed area. Because the people concerned spoke several languages and were predominantly illiterate, the answers were written in by the teams as far as possible out of sight of the householders, so as to avoid creating

the impression of officialdom at work. The questions, which in most cases were factual, often drew answers which had to be manipulated into a standard form. For example, the query regarding production or yield from the fields necessitated the standardization of answers as varied as the following: "Six *kunchas* (a Malay volumetric measure) for 4½ Kedah *relongs*"; "Seven *pikuls* (a Chinese measure of weight) for 1½ acres"; "Sufficient to let me sell one *kuncha* and to feed my family for the rest of the year"; "400 *gantangs* (a Malay volumetric measure) per acre". Taking into account the courtesies of approach, to complete the answers for a householder frequently needed two or three hours, and sometimes several visits had to be made to one household. Householders were interrogated by at least two members of the team on each occasion, one leading with the questions and the other acting as the principal recorder.

The questionnaire, drawn up in conjunction with the Director of Agriculture, covered a wide range to allow for unforeseen conditions. It was designed to disarm any suspicion that this was an enquiry which might be used detrimentally to the householders. The questionnaire was intended to be supplemented by notes written on the back as the interrogator saw fit.

The ownership queries posed many difficulties. Those who claimed to be owners of their field were always asked for the title-deeds, which were brought out readily. Tenants, however, often did not know the title number of the property they cultivated, which then had to be identified by an actual visit to the field and checked against the lot-maps. Sometimes such tenants were ignorant of the whereabouts of the owner, in which case either the village headman or the District Office's notice-server had to be consulted, but even these people were sometimes unaware of the facts about the owner. This seemed not to be obstruction so much as true ignorance because, they explained, there is no need to know the facts of ownership until an issue arises. That written records other than these title-deeds are unusual in the rural areas makes for major awkwardness. It obstructs a direct check on tenant-landlord relations, and impedes the peasant in giving accurate facts about his crops over the last few years. At no stage is the whole crop of a holding actually measured, even when divided in a sharing system. No peasant keeps a book-entry from year to year and he has no very concrete idea of the returns for his work. Where extra hands are used, the matter is arranged very casually and the only record is memory.

The tenant-landlord relation, in the absence of written agreement, was by no means easily verified. Sometimes a padi-property had been inherited jointly by heirs, each owning a fraction but not recording that fact or taking possession. The whole property might then be cultivated by one heir with or without a consideration being paid to the others, so that the cultivator was part-owner and part-tenant, but might yet pay no rent for the tenancy. Examples occurred of elderly persons living on their padi-property which was worked communally by neighbours, the return going entirely to the old people: this was neither owner-farming nor tenancy. A person might claim to be the owner yet the title be in the name of his dead grandfather. An aged peasant might live with grown-up children who cultivated the parent's fields: were these adults his tenants? Lending padi-land to friends or relatives without consideration appeared to be reasonably common and added to the difficulty of identifying tenancies in the padi-fields. It became evident that while the owner-cultivator category could be quite sharply defined, tenancy was more vague. A detailed classification of its types is necessary and should be specifically included in the questionnaires of future surveys.

Rents also presented difficulties both in fact and interpretation. The criterion of payment in cash or in kind permitted a straightforward classification, yet clearly the unwritten basis lends itself to an elasticity of conditions. Sometimes, it seems, the tenant succeeds by a hard-luck story in reducing the terms for any year, at others the owner can be more exacting. The balance appeared to be kept by local convention or public opinion, which clearly had special strength in those localities where forms of communal work continued to exist. There is much room for abuse in the absence of written agreements: whether this does exist on a large scale where the conventions are still so tribal is difficult, if not impossible, to determine.

One of the queries concerned padi *kuncha*, a Malay system of credit which has been a subject of public concern. Under it, a peasant takes an advance of money, of supplies, of textiles or of seeds against a promise to pay a *kuncha* (160 *gantangs* of padi weighing about 640 lb.) at harvest time. The teams found it impossible to pursue this line of investigation because of the shame with which it seemed to be associated. The shame appeared not, however, to be comparable with the horror of borrowing known among the old-style farmers of Britain and Eastern North America, who have puritanical ethics on the matter, but to turn on the point that giving away padi in the Malay self-feeding system of farming becomes a matter of taking the food from one's wife and children. A peasant would self-righteously report that his neighbours accepted *padi kuncha* yet give no facts about himself. Whether the condition is widespread or not, and whether it be on unreasonable terms, our investigation failed to indicate and results along these lines would appear to need psychological exploration rather than geographical techniques.

To cover the enquiry at motorized padi-mills, the pro forma of Appendix IV was used. It occasioned no difficulties: the total of such mills, as the reports indicate, was small.

(3) *Examination of the Land Register* was undertaken by two methods:—

- (i) To each questionnaire as in Appendix II was attached a copy of the Mukim Register entry for every lot number reported to be owned or worked by any one household. In this way a check was obtained on the recorded owner of each lot, its official area and official land use, the last date it changed hands and the District Officer's observations on the land and its owner.
- (ii) After the questionnaire for the whole area had been completed, any lots unaccounted for by enquiries among householders were traced in the Mukim Register and the whereabouts of owners sought through the headman.

It is to be noted that the Mukim Register does not include the address of those persons recorded as the owners, so that there is no direct means of contacting the owners and, except where they could be traced by personal enquiry near the lots themselves, the investigators had to ignore them.

Upon the map at this stage was inserted from the questionnaire the household number of the owner or the worker/tenant, and of any other household reported to be sharing the padi crop. This was necessary because the houses themselves had no official numbers.

#### (4) Processing

The field-maps, completed questionnaires and supplementary notes were brought back to the University in Singapore for processing, which included:—

- (i) Drafting clean master-maps, in colour and based on the lot-maps.
- (ii) Transferring data from the questionnaires to reduced maps.
- (iii) Preparing reduced extracts for publication from the master copy.
- (iv) Determining distributions and classifying the answers recorded in the household questionnaires.
- (v) Collating the general notes and examining any special items recorded on the backs of the household questionnaires.
- (vi) Writing a concise report on each locality, keeping as close as possible to those matters quantitatively answerable from the data obtained.

The processing, supervised by Mr. B.W. Hodder, took considerably longer than had been anticipated, yet the reports were in final form by November 1954. It was at once apparent that the quality of work had been uneven. The area, population and lay-out of Dulang and Mukim Four Central appeared to have been such that the team of five in each could be thorough and had time to check their investigations. The conclusion is that a group of five can in about three months adequately deal with some 1,000 households and a padi area of about 2,000 acres. In Krian the unit chosen included nearly 1,600 households and 9,500 cultivated acres, arranged in such a way that access was always by peripheral roads, so that there was an excessive loss of time. Though six men were employed, their material was less exhaustive.

A further observation is that in the case of Dulang and Mukim Four Central the unit was an administrative one permitting reference to previous statistical information. The Krian unit was arbitrary, bounded by three roads and including parts of three separate administrative units, so that our findings cannot be directly related to previous population or agricultural returns, which are by administrative divisions.

While it has to be accepted that studies in human ecology such as this project aimed at must attempt to present an objective view of the whole complex of circumstances and associations existing round the people in a chosen place, there have to be points of entry to the material and a form in the presentation. These have to be chosen by the processors of the data. In the case of these surveys, bearing in mind their purpose of assisting those who plan for the effective development of padi-growing areas, we chose to organize our reports to demonstrate the following aspects:—

- (i) The environmental character of each area.
- (ii) The communal structure and distribution of the residents.
- (iii) The present land-utilization pattern and the changes taking place in it.
- (iv) Spatial relations between padi-fields and those who work or own them.
- (v) Communities in relation to padi-land.
- (vi) The dynamics of community and population changes.
- (vii) The output, movement and retention of padi.
- (viii) High yielding and low yielding fields, their relation to official estimates, and circumstances said to be affecting the yields.
- (ix) The cycle of human activities in the production of padi.

- (x) The availability and phasing of activities unconnected with padi.
- (xi) The rate of transfer of padi-land from person to person, and of changes to and from the occupation of padi-growing.
- (xii) Water supplies to people and to padi-land.
- (xiii) Sanitation and drainage.
- (xiv) The centres of association and meeting-places.
- (xv) Lines of movement of padi and of people.

The greatest difficulty in processing became evident when dealing with the answers relating to output and retention of padi. The production of each field was estimated by the team on the basis of the owner's or worker's reply, subjective as this had to be in the absence of written records. These items from household questionnaires were summed to give the estimated output of the area under survey. Official estimates of local padi production were obtained differently. A couple of fields were checked for production by an agricultural officer while the harvest was going on, and then the average yield was calculated from these two samples, and the regional production obtained by multiplying this average by the total regional acreage. Our estimate was achieved by grossing the field-by-field returns, while the official one multiplied any error in its samples.

Regarding output, our figures differed substantially from official returns for the year 1953/4. They also differed considerably as between the three areas. In Mukim Four Central our figures led to an estimated yield of 764 *gantangs* of padi per cultivated acre, in Dulang 330 *gantangs* and in the part of Krian surveyed 84 *gantangs*. The corresponding official estimates for the same season were 240 and 447 *gantangs* per acre for Mukim Four Central and Dulang respectively. The Krian figure was difficult to correlate with the overlapping official estimates, but it was noted that though Krian padi-land was there officially assessed by a classification based on yield, there was little connection in the field between the classified and reported yields.

As one approach to estimates of peasant retention, we collated the reported capacities of each household's *jelapang* and store-boxes. In addition, sacks, jars and kerosene tins were used occasionally for storing padi but these could not be readily estimated. Another approach to the same end was made by way of the turnover in the rice-mills within the surveyed areas, but these commonly drew padi from outside and did not distinguish padi from the mukim in which they were located.

In future surveys, if close estimates are to be obtained, more detail needs to be collected regarding field output and peasant retention. The need for a padi study based on checking the field-by-field harvest as it takes place is self-evident. In the long term, an effort to interest the Malay in simple forms of account keeping in writing would appear most desirable.

When the reports were finished it was at once apparent that the situations they revealed differed so much, despite the small distances separating the areas, that it was unrealistic to summarize them. They have to be taken as samples, many more of which are needed to complete the mosaic of actuality. They report in detail never attempted before in Malaya, yet have limitations despite the sincerity with which the teams worked to produce them. It would be dangerous to generalize from the three samples for there is evidence that conflicting trends are at work even within the areas themselves.

Interest in the samples is the greater because they show the agricultural mode of self-feeding and the practice of cash agriculture to be going on side by side and in

different proportions. They indicate some of the transitional stages between those two modes of farming and should make clearer the difficulties which occur during the phases of change. The interaction between them is complicated not only because the original self-feeding community (the Malays) is learning other ways of earning a living and being drawn into the towns, but also because a newer commercial-farming community (from South China) is moving into the padi-lands and diffusing other ways of dealing with the land and other modes of getting a living from it. This aspect of changing modes of life in the padi-lands is of such interest that we have included as Part V a review of the whole situation in South-East Asia, so that the particular examples detailed in Parts II, III and IV may be seen against the general pattern of Asian food production. Part V is the substance of a lecture given to an international audience gathered in Washington in 1952 at a conference on "South-East Asia in the Coming World", which was sponsored by the School of International Studies of Johns Hopkins University, where the author was Visiting Professor.

PART TWO  
MUKIM FOUR, PROVINCE WELLESLEY



## CHAPTER I

### THE PHYSICAL ENVIRONMENT

THE PART of Province Wellesley in which Mukim Four lies is a rectangular coastal plain bounded in the north by Sungai Prai, in the east by uplands, in the south by Sungai Juru and in the west by the sea (Plate 2). Mukim Four covers 1,539 acres in the north of this plain. The stream in the south<sup>1</sup> is the only natural physical boundary, the others being either arbitrary lines or, as in the north, a road. Thus the mukim is not a geographical unit and its physical features continue beyond its political limits. The main road from Penang to Ipoh, crossing the mukim on a north-south line, provides a major channel of external influence upon local life.

The topography is simple (Plate 3 and Fig. 1). Mukim Four slopes gradually towards the sea in the west, from about seven feet above sea level in the east to some two or three feet in the west; it drains into Prai River via Sungai Pérta, Sungai Samagagah and Sungai Sintoh. The even—almost flat—slope is interrupted by (1) the *pérmatang* and (2) the granitic outliers of Bukit Merah and Bukit Pélindok.

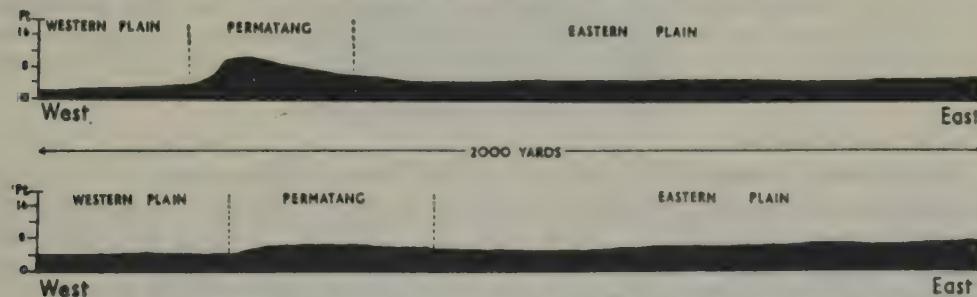


Fig. 1. Topographical sections across Mukim Four. For the directions of A-A' and B-B' see Plate 3. Note the greater height and steepness of the main *pérmatang* in the north.

#### (1) The *Pérmatang*

There are four *pérmatang* in the mukim whose names are To'Kandu, Janggus, Pauh and Bagan Sérail. They are low ridges of slightly higher land whose origin has sometimes been obscurely associated with off-shore bars. Running parallel to the sea, that is, in a north-south direction, these *pérmatang* are distinguished from the padi-fields surrounding them by being from two to four feet higher and by their vegetation of mixed fruit trees. They provide drier, better-drained land and attract settlement because they contain sub-surface water which is potable and less acid than that in the low-lying surroundings.

(i) *Pérmatang To'Kandu* derives its name from a pioneer settler whose grave-stone lies in the middle of the *permatang*. At its southern end *Pérmatang To'Kandu* is about 400 yards wide,<sup>2</sup> tapering to 260 yards at its northern end. It is locally thought to have been important when Sungai Pérta was used regularly by trading boats. Plate 3 shows that this *pérmatang* is breached by a small channel which acts as an outlet for excess water from padi-fields in the east.

1. Sungai Pérta. This is a tributary of the Sungai Prai and was formerly called Sungai Derhaka, meaning literally "rebel river", because it flowed into the main stream at an abnormally obtuse angle.

2. The rise from padi-field to *pérmatang* is so gradual that it is impossible to be exact about the limits of the *pérmatang*. Its edge was determined in the field by the accompanying change in vegetation.

(ii) *Pērmatang Janggus*<sup>1</sup> is separated from To'Kandu by a drain carrying surplus water from east to west. To the north it is partially separated from Pērmatang Pauh by padi-land. This central pērmatang is roughly elliptical, 900 yards long and 250 yards wide.

(iii) *Pērmatang Pauh*, like Pērmatang Janggus, is named after a tree not now found in the area.<sup>2</sup> Longest of all the pērmatang, it extends northwards well into Mukim Two, but remains narrow except at two points—Simpang Tiga and Pērmatang Pauh villages—where it is 450 yards wide and is densely peopled, especially at the road-junction village of Pērmatang Pauh.

(iv) *Pērmatang Bagan Sērai* in the north-west is a fragment of a pērmatang, being only the southern extension of Pērmatang Kling from Mukim Two. It is isolated from Pērmatang Pauh by five hundred yards of padi-fields and upon it is the riverside settlement of Bagan Sērai.<sup>3</sup>

The arterial metalled road from South Province Wellesley to Butterworth follows the crests of the first three permataang. Culverts carry it over the two drainage channels which breach Pērmatang To'Kandu; the padi-land separating Pērmatang Janggus from Pērmatang Pauh has been filled in by the road builders. Thus the three permataang now appear in the landscape as one long feature extending from the northern to the southern boundary of the mukim. For convenience, this feature, though formed by the three pērmatang, will be called the *main pērmatang*.

## (2) *The Granite Hills*

Bukit Merah stands in the north-east of the mukim, rising sharply to about 180 ft. above the surrounding padi-lands. It derives its name from the red laterized soil exposed there, though it is also called Bukit Che Din after a Malay who once built a house on its peak. This elongated, asymmetrical granite hill covers 28 acres. Bukit Pēlandok is a smaller granite outlier 250 yards to the west of Bukit Merah. It is circular in shape, 60 ft. high and only 9 acres in area.<sup>4</sup>

The average monthly temperature conditions are indicated in Fig. 2. Daily temperatures obtained from records at Bukit Mērtajam show that the diurnal range is 14°–20° F.; usually the daily minimum is of the order of 73° F. and the daily maximum 90° F. Rainfall is high, averaging 96 in. per annum and occurring throughout the year. An alternation of south-west and north-east winds induces double rainfall maxima which provide the climatic features of greatest local agricultural significance. Records at the Agricultural Experimental Station show that the periods of heavier rainfall are during March–May and September–November (Table 1).

TABLE 1: MONTHLY AVERAGE RAINFALL AT BUKIT MERAH, 1945–53 (IN INCHES)

Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sept.	Oct.	Nov.	Dec.
4·68	4·79	7·60	11·7	7·73	5·37	6·73	7·18	10·8	14·6	8·77	6·14

A thick cover of weathered material overlies every structure except the granite hills. Two types of alluvium may be distinguished, river sediments and shore deposits.

(i) The river alluvium is a fine, bluish-black silt, found mainly in the eastern plain as a mantle two or three feet thick over the subsoil.

1. The *janggus* tree is *Anecardium occidentale*.

2. The *pauh* tree is *Buchanania sessilifolia*.

3. Bagan Sērai owes its name to its being a landing place (*bagan*) on Sungai Prai. Sungai Prai is about 420 ft. wide and sufficiently deep to allow junks and lighters to ply upstream as far as the Bagan Sērai pontoon bridge. *Sērai* is Malay for citronella (*Cymbopogon citratus*). Another name for the village is Titi Timbul (floating bridge).

4. Bukit Pēlandok = Mouse-deer Hill. This connotes smallness in Malay phraseology.

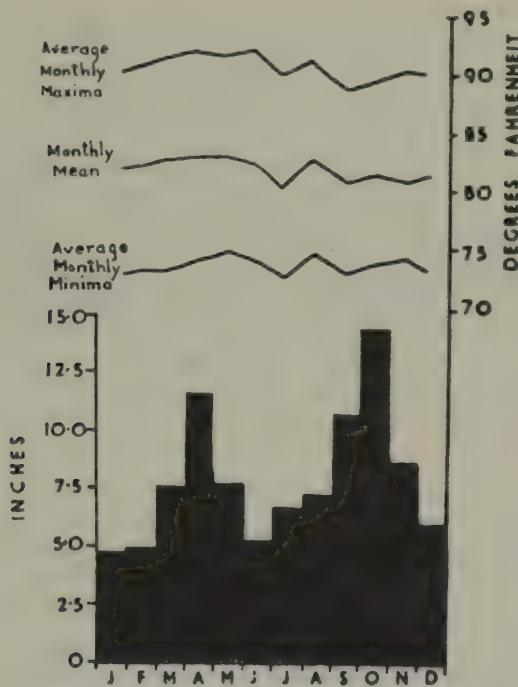


Fig. 2. Climatic data for Bukit Mertajam.

(ii) Shore alluvium is mainly in the western, lower portions of the mukim, though it exists also beneath large areas of the river alluvium in the east. In the western plain one plot of padi is scattered with broken marine shells up to 3 cms. in diameter; in the sugar-cane gardens of the south-west broken shells are evident in a freshly dug well profile.

Sandy soils occur only on the main pérmatang and at Bagan Sérail. Their top few inches are coarse and whitish, changing below into finer material mixed with clay. Laterized soils are found on Bukit Merah and Bukit Pélendok, red on the hills themselves and yellowish at the sides.

The only detailed data on soils refer to samples taken by members of the Agricultural Department's Experimental Station at Bukit Merah (Table 2). Each soil sample is classified into light, medium-light and heavy by the percentages of clay in the total sample.

TABLE 2: SOIL SAMPLES FROM MUKIM FOUR

Place of Sample	PERCENTAGE		
	Light	Medium-light	Heavy
Bukit Merah	10	50	40
Pérmatang Janggus	5	75	20
Pérmatang Pauh	15	35	50
Sungei Dérhaka	10	50	40
Bund Merah	Nil	35	65

Bunds, besides marking property units, also prevent excessive water-flow and soil-wash and are virtually contour terraces. Soil erosion is taking place in the south of the mukim, where padi-lands are slumping owing to lateral erosion by the Sungai Pěrtama.

The natural vegetation cover has been practically eliminated in Mukim Four. There are two patches of *nipah* swamp, one of about 13 acres in the north-west corner near Bagan Sěrai, and the other of about 5.5 acres lying along Sungai Pěrtama to the south (Plate 3). Smaller areas are under *běmban* (*Donax canniformis*), *api-api* (*Avicennia officinalis*), and *měngkarong* (*Fuirena umbellata*), a species of tall grass used by the villagers for making rice-sacks and mats. *Běmban* is common between Pěrmatang Janggus and Pěrmatang Pauh and on the low-lying edges of the main pěrmatang. *Api-api*, mixed with other water-loving plants, grows along the banks of Sungai Prai.

## CHAPTER II

### POPULATION AND SETTLEMENT

ITS POPULATION of 3,695 in an area of 3.07 sq. miles (1,969.39 acres) gives Mukim Four a population density of 1,204 per sq. mile. This figure, however, means very little, for there are large unpopulated areas separating five concentrations of houses (Plate 4).

(1) A linear group of 627 houses along the main pérmatang, which was reputedly the original focus for settlement in the area. The axis is now a metalled road which has proved an added attraction to settlement, so that groups of houses have grown up along both sides of it. While the general pattern is one of scattered houses spreading within a belt parallel to the road, there are in detail three foci of concentration which are known as Sungai Pérta<sup>1</sup>ma Village<sup>1</sup> in the extreme south, Pérmatang Janggus Village in the centre and Pérmatang Pauh Village in the north.

(2) A group of 69 houses (61 Chinese) in the north-east, which comprises 23 and 46 dwellings round Bukit Pél<sup>2</sup>landok and Bukit Merah respectively. Hugging the lower levels of the hills, the houses are arranged in an oval surrounding Bukit Pél<sup>2</sup>landok. Around Bukit Merah the house pattern resembles a "J", being influenced by the hilly area of Crown Land in the north-west corner.

(3) A group of 48 houses at Baroh in the south-west, which form a dispersed colony of Chinese vegetable farmers in a predominantly rice-growing area.

(4) A group of 68 houses on the Bagan Sér<sup>3</sup>ai Pérmatang. This group contains people whose employment is more varied than elsewhere in the mukim. Padi-planters, field labourers, government workers, general dealers, fishermen and stevedores make up the population of 218 persons. The house pattern resembles that of the main pérmatang, being arranged astride the road which is here aligned north-south along the top of the permatang.

(5) A dispersed settlement of 18 houses at Hutan Nibong in the south-east. This is a wet, muddy area during padi-growing and houses have been built scattered among the padi-fields. Thus the distribution pattern, even more so than in the damp, vegetable area of the south-west (3), is one of dispersion.

### RACIAL COMPOSITION

The racial communities of Mukim Four have settled in a distinctive pattern. Along the main north-south pérmatang and at Bagan Sér<sup>3</sup>ai Malays predominate, while at Baroh, Bukit Pél<sup>2</sup>landok and Bukit Merah, Chinese form the majority. Of the 25 Indian families, 7 are at Bagan Sér<sup>3</sup>ai, 13 at Pérmatang Pauh village, 2 at Pérmatang Janggus village, 2 at Sungai Pérta<sup>1</sup>ma village and 1 at Bukit Merah. The attraction of shopping centres is evident.

#### Malays

All 2,252 Malays in the mukim claim to have been born in Malaya; 2,029 have their houses concentrated on the north-south pérmatang. A further 151 are settled at Bagan Sér<sup>3</sup>ai so that only 72 Malays are dispersed elsewhere in this mukim. An unequal

1. Formerly known as Sungai Derhaka village. The house density here is high: 128 houses occupy an area of 32 acres, divided into 74 lots.

sex ratio of 646 males to 753 females, together with 853 children below the age of twelve, is an indication of the shortage of Malay adults due to the flow into towns and recruitment to the Security Forces and estates.

### *South Chinese*

In this mukim, of the 1,349 people of South China origin, 1,199 live around the two hills and in Pērmatang Pauh village. Plate 5 shows how segregated the dialect groups have become. Cantonese cluster at the hills and in Pērmatang Pauh village, their concentration being very great in Lot 287 (of 13.22 acres) which contains 15 families; they engage in padi planting as owners, tenants or workers. Forty-eight households of Tiechius in the south-west are vegetable farmers. Of 60 Hokkien households in the mukim, all but two (one in the north-east and one in the south-west) live along or near the main north-south road or Bagan Sērai path. The South Chinese as a whole have an adult sex-ratio of 401 males to 358 females, with 590 children below twelve years of age.

### *Indians*

Indians, both Hindu and Muslim, total 94, with 39 male to 20 female adults, showing the greatest male proportion of the three major racial groups.

## POPULATION DYNAMICS

By the end of the nineteenth century the mukim is said to have contained about 2,000 people, mostly Malays, with a sprinkling of Chinese and Indians,<sup>1</sup> in a largely self-sufficient society, with a close balance between the food needed and the number of hands available to produce it. It gradually became a rice-exporting area and by about 1910 there were at least 100 Chinese families at Sungai Pērtama and Baroh. They milled and exported rice, imported salt, sugar, cloth and other necessities in small, shallow-draught junks via the Sungai Dērhaka, then the main line of access to and from the area. By about 1915 the general opening up of rubber estates and the building of the Malayan railways provided opportunities in other areas, the result being a general exodus of both Malays and Chinese. Sungai Pērtama lost significance as a river port, and neglect and silting now make it inaccessible to small junks. Hutan Nibong in the south-east is reputed to have had a similar history of decline in this century.

After 1920 the population generally increased, although by no means uniformly. The Japanese invasion of Malaya, the emphasis on food production by both Japanese and British Military Administrations, and the introduction of *taiwan* padi as a second crop, attracted Chinese to the north-east of the mukim and to Pērmatang Pauh. The *kētua* of Bukit Merah reports that whereas in 1941 there were 17 and 26 houses (including Malays) at Bukit Pēlandok and Bukit Merah, today there are 23 and 38 Chinese houses respectively. The Emergency and the intensive recruitment campaign caused an exodus while the rubber boom of 1950 resulted in another slight lowering of the population figures. The fall in rubber prices caused the return of about 40 people in 1953.

### *Malays*

A comparison of 1947 Census figures<sup>2</sup> with those obtained by the team in June-August 1954 shows an increase of 92 Malays (from 2,160 to 2,252). The natural

1. Information given verbally by the *pēnghulu* and *kētuas*.

2. Figures from 1947 Census Team at Bukit Mērtajam.

increase has been offset to some extent by the outflow of adults to towns, estates and the public services. Any detailed comparison with 1947 is impossible because the Census Report gives figures for Mukim Four combined with those of Mukim Five.

There is a seasonal migration of Malays in late December and January every year to help in the Kedah rice harvest. The consideration is free board and lodging plus from M\$4-5 a day. The local religious chief estimates the usual number as about 300 persons.<sup>1</sup> They stay away for 20-25 days, after which they return to harvest their own padi, or to be hired for the local harvest.

#### Chinese

The Chinese population of the mukim has increased from 991 in 1947 to 1,349 in 1954, an increase of 36 per cent against that of 4 per cent for the Malays. The possibility of double cropping, the insecurity of other areas and restrictions due to Emergency Regulations help to account for this high increase. The limited land at Bukit Merah and Bukit Pelandok has led to the building of Chinese houses upon some padi-fields, for example the five houses in Lots 469<sup>29</sup>, 469<sup>30</sup>, 469<sup>17</sup>, 469<sup>2</sup>, and 469<sup>19</sup>, while in Pérmatang Puah two houses have encroached on Lot 334<sup>11</sup> (See Plate 6).<sup>2</sup>

#### Indians

The Indians have increased from 69 to 94 since 1947 (38 per cent). This, for what it is worth, is the largest percentage increase of all the communities.

### IMMIGRANTS AND THEIR ORIGINS

Of the total of 830 householders questioned, 410 Malay and 146 Chinese householders report they have been living for ten years or more in the mukim. On the other hand, 146 Malay and 128 Chinese householders say they have lived for less than ten years in Mukim Four. In other words, three out of every eleven Malay householders are newcomers by this standard as against two out of every five Chinese householders.

Table 3 shows that of those householders who have lived in the mukim for less than ten years, three-quarters of the Malays come from other parts of Province Wellesley and Penang, half of the Chinese from China proper and a quarter from Penang and Province Wellesley.

TABLE 3: PLACES OF ORIGIN OF IMMIGRANT HOUSEHOLDS

Chinese			Malays		
China	...	67	Penang	...	41
Penang	...	19	Butterworth	...	40
Butterworth	...	13	B. Mertajam	...	30
Kulim	...	13	Kedah	...	25
B. Mertajam	...	8	Kulim	...	10
Kedah	...	8			
		—			—
		128			146
		—			—

1. The movement to Kedah is large enough to cause a temporary cessation of Friday prayers at two local mosques; a minimum of 40 persons is necessary to form a quorum before this kind of service can be held.

2. These numbers refer to the Survey Office Lot Maps.

## HOUSE TYPES

*Malay*

All the Malay houses are on piles. Each Malay householder when asked why he built his house on piles gave one or more of three reasons:—

- (i) it accorded with Malay tradition;
- (ii) it afforded protection against snakes and animals;
- (iii) it afforded protection against flooding or dampness.

In no instance was the comment offered that the style provided storage space or assisted ventilation. The height of the piles varies considerably, being highest (8 ft.) at house 285. An "elephant foot" of concrete or granite is ubiquitous beneath the stilts of local Malay houses.

*Chinese*

No Chinese house is on piles, even where the water is high and flooding common, as in the cases of the 15 Chinese houses occupying Lots 327 and 328, the two in Lot 334<sup>11</sup>, and the Chinese houses at Hutan Nibong in the south-east.

*Building Materials and Design*

Bamboo, corrugated iron, nipah, atap, cement and timber (*méranti*, *chēngkawang*, *chēngai*, *mērbau* and *api-api*) are the main building materials. The zinc sheeting and cement are imported from overseas, bamboo, nipah and api can be obtained within the mukim, and the other timber comes from Kedah and Perak. The bamboo used is of a species known locally as *buloh duri* (thorny bamboo, *Bambusa blumeana*), said to be preferred owing to its thickness, hardness and resistance to insects. Thirty bamboos, each 50 ft. long, furnish sufficient material for the walls of a house covering a floor space of 400 sq. ft.

In spite of the variety in type and combination of building materials two types of roofing predominate. Most common is the nipah atap roof. The zinc sheeting roof is found on only 38 houses in the whole mukim and, as Plate 8 indicates, the pattern of houses using it correlates with village shopping nuclei and main roads. The roof angle is greater (about 40° from the horizontal) when atap is used than when zinc sheeting is used (about 30°) for two reasons:—

- (i) Atap requires a greater angle to shed the water and so prevent rotting.
- (ii) Zinc sheeting is more expensive and a smaller roof angle requires less covering.

The average floor space of Malay houses in the Mukim is 291 sq. ft., as compared with the Chinese average of 460 sq. ft. But this large difference is to some extent offset by the larger number of Chinese per house—5.78 against 4.05 Malays. Thus the floor space density is 78.3 sq. ft. per Chinese and 71.8 sq. ft. per Malay. The equivalent figure for the Indian houses is 68.1 sq. ft. These average figures conceal the wide extremes found. Among the Malays, House No. 440 has 8 persons in 250 sq. ft. giving each member 31 sq. ft. House No. 11, on the other hand, has a floor space of 1,500 sq. ft. for only 4 persons, thereby allowing each member of the household 375 sq. ft. The Chinese extremes are House No. 719 (10 persons to 300 sq. ft.) and House No. 220 (8 persons to 1,800 sq. ft.). Indian extremes range from House No. 803 (7 persons to 300 sq. ft.), to House No. 647 (2 persons to 500 sq. ft.).

## CHAPTER III

### PADI

PADI is grown by 59.6 per cent of all households in Mukim Four (Table 4). Padi-land covers 78.1 per cent of its total area (Table 5). The main permatang divides the padi-land into two unequal parts, the larger being in the east. The western part is without irrigation facilities and depends directly on natural rains, while the eastern has an irrigation system from the Sungai Kulim headwaters. Irrigation works were started in 1935, but only in 1949 were proper distributors and feeders constructed. No water rate is collected, but it is proposed to charge \$2 per acre in 1955.

TABLE 4: HOUSEHOLDS ENGAGED PRIMARILY IN THE PLANTING OF PADI

Community		Number	Percentage of Total Households in Mukim
Malays	...	383	68.4
Chinese	...	101	44.5
Indians	...	2	7.7
Total	...	486	59.6

TABLE 5: LAND USE IN MUKIM FOUR

Land Use	Acreage	Percentage of Total Mukim Acreage
Padi	1,550	78
Vegetables	69	3
Kampong, nipah swamp, etc.	350	19

Of the area under padi, about 95 per cent (1,484 acres) is cultivated a second time each year with a crop of *taiwan* padi. Those lots which do not cultivate a second crop (Plate 10) are said to suffer from insufficient water in the unirrigated west and from excessive (deep or long-lasting) water in the irrigated east. In 1954, 65.8 acres of padi-land were found to be in fallow, the rest being in *taiwan* crop.

Regarding the yield of the two types, no farmer reports the *taiwan* as yielding more than the *malayan* crop and the common response is that the *taiwan* is about three-quarters of the latter. Most of the area has a yield for the *malayan* crop of over 300 *gantangs* per acre, the higher yields being in the south-west of the eastern padi plain. The local official estimates of average yields are 320 *gantangs* per acre for the main padi crop; before irrigation facilities were installed the yield was officially estimated at 240 *gantangs* per acre. Everywhere the *malayan* padi is described as the main crop and, indeed, was the only one before 1942. Strains of *malayan* padi grown here are, in the areas of shallow soils: *Radin keling*, *Koncho*, *Sachupak*, *Mayang ebos*, *Bongok* and *Pulut hitam* (glutinous). In areas with deep soils *Radin kélumbong*, *Seri raja*, *Intan* and *Anak gajah* strains are grown and *Reyong*, *Pato*, *Konto* and *Sérandah* elsewhere. The *taiwan* padi strains used locally do not appear to be connected with any one soil type; they are *Ryu shu*, *Pai bee fun*, *Goh chi sei*, *Taichu mochi* and *Taiwan sachupak*. Though it has thinner husks, the *taiwan* padi is claimed to have more rice per stalk than the *malayan* crop.

Each farmer was asked what was the return of padi for each field he cultivated. None keeps accurate records through the years and in the absence of firm corroboration by other means, such statements are subjective; the size of *jelapang* and other fixed stores is relevant as a check but not absolutely. Some farmers know the usual yield better than they know the total production of the lot and the team attempted to record always the yield per unit area, whatever the nature of the reply. Of the lots reporting yields of about 450 *gantangs* per acre, 42 per cent are owner-worked and another 7 per cent are partly owner-worked, leading us to suppose that some of the lower yields are understatements to mislead landlords, who stipulate a rent in kind or cash on the basis of a yield of 370 *gantangs* per acre and alter the terms if the yield varies significantly on either side of this. From the household replies it is calculated that, taking the production for that acreage of the mukim for which yield data could be secured, the average yield per acre of *malayan* padi is 394.9 *gantangs* and of *taiwan* 369.1 *gantangs* per acre, so that from the average acre used each year for padi the return is about 764 *gantangs* per acre.

#### CYCLE OF ACTIVITY

Each planting of rice is timed in relation to one of the rainfall maxima—that is, it takes place in May or October (see pp. 21-2). Initiative in this respect by the farmer is limited because planning dates are laid down by a committee (consisting of the District Officer and representatives of the Agricultural Department and the local Padi Planters' Association) whose authority derives from Part 4:6(a) of Vol. 4.31 of *Straits Settlements Laws*. How the prescribed time of planting varies is shown in Table 6, which covers the last five years. Factors considered in setting the date include the weather, indications of pests, the state of the field bunds, and the availability of irrigation water.

TABLE 6: OFFICIAL DATES FOR PADI ACTIVITIES

Work	1950	1951	1952	1953	1954	
	Malayan Padi				Taiwan	Malayan
	—	—	—	—	—	—
1. Repair of bunds begins	15/6	1/8	20/7	20/7	—	—
2. Repairs completed and irrigation begins	1/7	15/8	5/8	5/8	1/8	—
3. Sowing begins	15/7	15/8	5/8	5/8	10/8	1/4
4. Sowing completed	15/8	10/9	31/8	15/9	25/8	—
5. Field preparation begins	15/7	21/8	10/8	10/8	—	—
6. Preparation completed	15/9	7/10	27/9	15/10	—	—
7. Transplanting begins	1/9	4/10	24/9	1/10	15/9	25/4
8. Transplanting completed	30/9	1/11	20/10	31/10	20/10	10/5
9. Draining-off ends and harvesting begins	—	—	—	15/2	15/2	30/7
10. Harvesting completed	—	—	—	15/3	15/3	15/8

That there are now two cycles of cultivation—one for *malayan* padi and another for *taiwan*—is of major local significance in other ways besides that of increasing the return per unit area. Local farmers now have less time for other forms of employment, become specialist padi producers, and have a surplus of padi for trading. By committing themselves to the one crop, they have greater security of supply and are further removed from a self-contained, subsistence economy.

Roughly speaking *malayan* padi here occupies the ground for about 7½ months and *taiwan* for about 4 months. The former has always been carefully regulated in timing; the latter has for many years been a casual private venture and unco-ordinated throughout the mukim. Today *taiwan* padi is so generally used here that the local committee also stipulates the phasing of its field work. This explains the difference in Table 6 between the data for 1954 and those for earlier years.

#### FIELD PROCESSES

Before being set out in the fields, the seed-padi is closely sown in a seed bed and carefully tended as though in a garden. *Malayan* seedlings are considered ready for transplanting when about 50 days old, but *taiwan* are transplanted after only 25 days in the nursery. Near the time of planting the fields are very wet, particularly on the lower levels, and covered with fairly high grass which must be slashed and piled to rot for a while before being spread on the fields as green manure. A buffalo-drawn roller (*tengering* or *ngolok*) may be dragged over the fields to kill the grass. Thereafter the fields are considered ready to take the young padi. Where the ground is slightly higher or slightly less clayey it is also less wet, when buffalo-drawn ploughs may be used for faster elimination of the grass. Locally it is feared that buffalo ploughing may lower the level of the fields and cause excessively deep water during irrigation.

Transplanting is done on the fields which have been slashed (and therefore have compacted soil) by prodding the seedlings into the ground with a *kuku kambing*. This is a Malay technique for stiffer ground. On land which has been ploughed and is, therefore, looser seedlings are pressed in by hand; both Malay and Chinese padi-planters follow this technique. Water is always standing on the fields while transplanting is going on and the seedling will tolerate any depth of water as long as its tip is exposed. The technique is the same for both *malayan* and *taiwan* strains, though when introducing the *taiwan*, the Japanese insisted on manual transplanting within fifteen days of sowing, claiming that though the plant is then delicate, it will root more freely in the ground. Since transplanting is still mainly the job of women, at that time (November-December) local men are free to travel for the harvest then going on further north near Alor Star.

Weeding must be done one month after transplanting, the earlier the better, and is considered essential for full development of the padi. It is largely done by women, employed at M\$3 a day. Fertilizers are applied immediately after weeding.

Harvesting is done with a sickle (*pisau sabit*) and the stalks are threshed in mid-field where screened wooden tubs are dragged on to the wet ground for the purpose. From the tubs the grain is carried from the fields in baskets slung on a pole; no form of wheeled transport is used, and movement is along the bunds between fields, which accounts for the absence of formal paths or ways across the padi-land and leads to the need for continual repair of the bunds.

All padi is brought out of the fields for its further processing or storing close to the houses, that is to the *pematang*. Drying the grain takes place on special concrete

floors seen near large houses and shops or, in smaller units, on *mēngkuang*<sup>1</sup> mats spread out in the open. Hand-winnowing is usual and needs either an occasional strong wind or a locally made hand-blower.

Seasonal labour is usual for harvesting and carrying in. Malays contract to work by area but Chinese at piece rates. Of 615 padi lots enumerated, 151 are regularly employing extra labour for harvesting, of which 90 are Malay lots, 48 Chinese and 3 Indian. Proportionately fewer Malay farmers hire help for their harvest. Some labour from Kedah enters this mukim for the *taiwan* harvest in August. In all cases the labour is reputedly hired for cash and not for a proportion of the crop. Only one lot-holder, a Chinese, claims that friends help without payment; no evidence was found that the *bērdērau* system operates in the mukim.

Plate 9 shows the distribution of rest sheds in the padi-fields of the mukim; they are all in the eastern plain, more especially in the isolated east and south-east. These sheds are for daytime use by people, but may also provide storage space for threshing tubs and other cumbersome equipment. Though temporary in aspect, these small atap rest sheds are definite features of the landscape. They consist essentially of a raised sleeping platform and an earthern storage floor.

Because the whole grain crop moves to the houses at harvesting, substantial storage space has to be provided, and here takes the form of *jēlapang* (stilted, house-like structures used exclusively for padi), standing beside the farmers' living places), boxes placed under or within the house, and gunny bags placed within the house. Cats are encouraged to destroy rats and mice near these stores. The investigators obtained estimates of the storage capacity from each household, that of *jēlapang* and boxes being of chief interest, while the bags varied too much from year to year to be reliable. Of the households engaged in padi-farming, 177 have *jēlapang* (all but three being Malay), 137 had large box-stores (all but three being Malay), and 116 (of which 78 per cent were Chinese) said they stored padi in bags. For the whole mukim, the *jēlapang* have an average capacity of 1,030 *gantangs*, the largest being 2,700 *gantangs*, and the smallest 240 *gantangs*; the total *jēlapang* capacity reported was 170,500 *gantangs* and the total store-box capacity 41,700 *gantangs*.

The cycle of movement towards the stores must closely follow the cycle of harvests and, therefore, has two phases related to the *malayan* and *taiwan* crops. Following the transport of padi from the field to the store, some grain moves to the mill in small units, usually by bicycle to a miller's agent such as a small shopkeeper. Large padi sales are collected from the household by a lorry sent from the mill.

From the individual returns of the padi-farming households, it appears that the mukim production is about 358,000 *gantangs* of *malayan* padi and 330,000 *gantangs* of the *taiwan*, which combine to give an annual production of 685,000 *gantangs*. In the year April 1953–March 1954, 470,075 *gantangs* were reported to have been processed by the local Chinese rice-mill and 100,400 *gantangs* by the mukim co-operative mill; a balance of at least 114,525 *gantangs*<sup>2</sup> was apparently retained by households for private milling or sent to mills outside the mukim, the proportions not being assessable. These estimated weights should be compared with the total estimate for *jēlapang* and store-box capacity, which is 212,200 *gantangs*, or roughly twice the estimated amount retained.

1. The common screwpine (*Pandanus atrocarpus*).

2. "At least" because the two mills inside the mukim mill padi grown outside the mukim, though not in large quantities.

### FERTILIZERS

Ground phosphate, sulphate of ammonia, rock salt and bat guano are the locally used fertilizers, bought from the rice mills or from the local shops. Bat guano is the first choice, for it is effective for two or three crops after each application at the rate of 75–125 *gantangs* per acre. However, it is expensive and the fact that its effects are sustained are unimportant for those who hold only one year's lease. Phosphate is both a fertilizer and a means of preventing stem-boring pests, particularly caseworm; it is effective for one crop only and is also applied at the rate of 75–125 *gantangs* per acre. Sulphate of ammonia at 25 *gantangs* per acre, and rock salt (also a stem-boring pest preventative) at 125 *gantangs* per acre are commonly used by the Chinese. Cow and buffalo dung, together with poultry droppings, may be broadcast into padi-fields at 75–125 *gantangs* per acre.

Fertilizers are taken by farmers from local dealers on credit; while the cash price of ground phosphate averages M\$4.50 per bag of 80 lb., the credit price varies between M\$5.50 and M\$6 per bag or payment fixed in padi at lower than the current market price.

### TRACTORS

Tractors used on the Agricultural Experimental Station are not available to the mukim. Four tractors are rented out privately by two Chinese and also by the Chinese rice-mill at M\$8 per hour or M\$28 per acre.

Tractors here are said to face several difficulties. They work effectively only on dry fields or fields under 6–8 in. of water, and they can reach mid-field plots only by passing through other properties. If the ploughing is too deep, the fertilizers get buried. Nevertheless, the potentialities of tractors have led the Malay Padi Planters' Association to arrange for two tractors to be bought. A tractor belonging to RIDA<sup>1</sup> at Nibong Tebal and available for hire in this mukim, is not popular, reputedly because of the poor work it does.

### PESTS

The most common insect pest is the *chēnangau* (*Leptocoris acuta*), a greyish-brown, stinking insect which drains the young padi of sap by boring its seed. The *chēnangau* may be caught by a net, but the damage is reduced when large areas ripen simultaneously and is a point considered when regulating dates.

Rats, nesting in bunds and in undergrowth near the padi-fields, are most troublesome after rains. They are killed by poison (zinc sulphide) supplied free by the Agricultural Experimental Station. The Chinese use dogs as rat catchers. The peasants are required by law to protect their land against rats; for instance, "from 15th July, 1953 to 1st May, 1954 every owner or occupier of land shall keep every part of his land, being rice-land or being within a distance of two chains from any part of the boundary of any rice-land, clear and free from *lalang*,<sup>2</sup> shrub and other undergrowth likely to harbour rats and other vermin".<sup>3</sup> The main bird pests are the *pipit padi* and the *burong chak* (weaver). Caseworm attacks padi one month after transplanting. Appearing most often on hot days after rain, it causes stunted growth and lowered yields. Field drainage, ground phosphate, sulphate of ammonia, lime and rock or arab salt applications are the best means of protecting crops from it.

1. Rural and Industrial Development Association.

2. A coarse grass, *Imperata cylindrica*.

3. Vol. 4, 31. S.S. Laws. Ch. 145.

## PLANTERS

Of the 486 households (out of a total of 823) engaged primarily in padi-planting, the heads of 147 were previously in other work.

TABLE 7: PREVIOUS OCCUPATIONS OF PADI-PLANTERS

		Malays	Chinese	Indians
Rubber	...	13	15	—
Tin mining	...	1	3	—
Government service	...	43	...	—
Other work unconnected with padi	...	30	41	1
Totals	...	87	59	1

Two facts stand out in this table: first, the high figure of Malay householders formerly engaged in Government service (mainly as policemen); and second, over half the Chinese padi-growing householders have changed to this from another occupation.

## CHAPTER IV

### OTHER AGRICULTURAL ACTIVITIES

THOUGH THE Agricultural Land-Use Map (Plate 10) emphasizes the dominance of padi-land in the agricultural landscape, there are three other important crops: coconuts, vegetables and rubber, which cover the following acreages: rubber 26.4 acres, coconuts 104.6 acres, vegetables and sugar-cane 68.7 acres.

*Coconuts* are grown both on small-holdings and in kampongs. The small-holders are mostly Chinese and are also engaged in pig and duck rearing, but kampong coconuts are Malay-grown. In Plate 10 the latter areas are not distinguishable for the coconut palms are scattered among houses and fruit trees in the kampongs. There are no coconut mills in the mukim; copra is sold to oil-mills outside and the oil imported. That the people of the mukim do not make their own oil is related to two facts: double cropping of padi leaves them little time for other work, and the cost of a bottle of oil made at home is thought to be no less than that of one bought in the shops (60 cents).

Copra dealers buy coconuts both in nut and meat form, the former fetching from nine to eleven cents each, and a pikul of coconut meat M\$14. There are two copra dealers, both Malay, in the mukim. One in Pérmatang Janggus has a concrete drying-floor, of approximately 2,000 sq. ft., behind his shop, and an average monthly sale of 50 pikuls of copra, his chief buyer being the Eng Hock Oil Mill at Pérmatang Panjang in Mukim Six. The other dealer—in Pérmatang Pauh—has a similar drying-floor, but sells about twice the amount of copra, mostly to Penang and Bukit Mertajam. Neither dealer employs permanent workers.

#### *Vegetables*

The growing of vegetables is confined to the Tiechiu farmers of the Baroh area in the south-west. Long beans, horse radish, leafy vegetables, cucumbers, brinjal, sweet potatoes, tapioca and sugar-cane are the main crops. Padi once occupied this area and even the slight drainage necessary to convert it to vegetable growing diminished the water supply of adjacent fields, several of which are looked upon now as marginal land and grow only one crop of padi a year, reputedly because of this water scarcity. For the growing of vegetables the Baroh area is too wet and affected by tidal fluctuations; vegetable beds are, therefore, built up well above field-level. The importance of the built-up beds is emphasized in the case of sugar-cane, grown in rotation with vegetable crops in a system by which the position of the bed changes for each crop (Fig. 3). Each farm devotes roughly one-third of its acreage to sugar-cane, a ten-month crop which, not being seriously affected by pests, is a good insurance. It is sold for direct consumption as a sweet and not for making sugar.

*Other agricultural activities* include a little rubber tapping—in the west by Malays, and on Bukit Merah in the east by Cantonese small-holders—and fishing in the water-courses.

### Livestock

Nearly every house has some kind of livestock, fowls, ducks or pigs (Table 8). Malays rear fowls mainly for eggs, which are bartered at local provision shops, but fowl disease, here thought to be associated with exceptionally rainy seasons, has killed many. Ducks are often reared but on a seasonal basis to avoid damage to young padi.

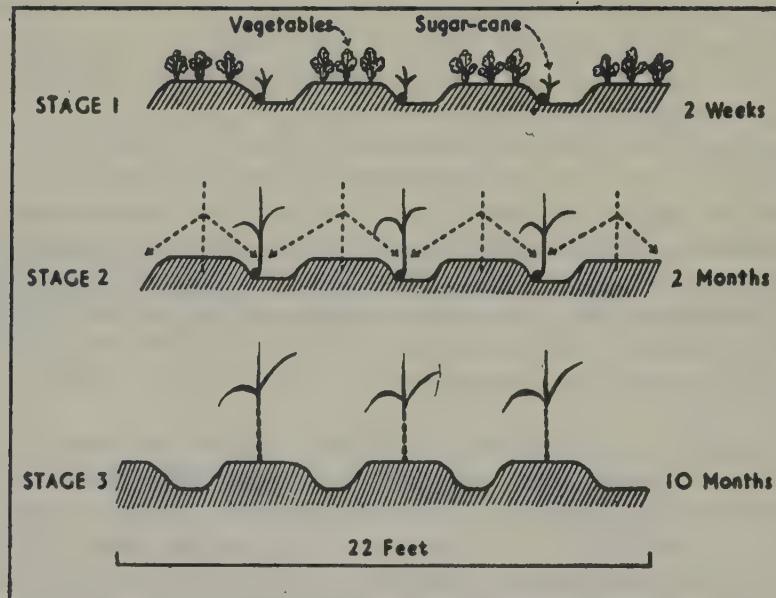


Fig. 3. The shift of beds during the sugar- and vegetable-growing cycle.

Only the Chinese breed pigs, which are fed on rice-bran, banana trunks and wild yam or *kēladi*. Table 8 shows that the Chinese have more fowls and far more ducks than the Malays. While the Chinese average 31 ducks and 14 fowls per household, the Malays average 3 ducks and 4 fowls per household.

TABLE 8: LIVESTOCK IN MUKIM FOUR

	<i>Fowls</i>	<i>Ducks</i>	<i>Buffaloes</i>	<i>Cows and Bulls</i>	<i>Goats</i>	<i>Pigs</i>
Malays	...	2,123	1,483	25	24	94
Chinese	...	3,685	7,741	13	2	8

### MILLING OF PADI

The two rice mills, *Sungei Pērtama* Co-operative Mill and the *Ghee Bee* Rice Mill, also serve neighbouring mukim. Both are powered by diesel motors and charge M\$1.50 to mill a bag of 32 *gantangs* of padi; but if the farmer surrenders his bran to the mill, no charge is made, for the bran can be sold to local duck- and fowl-rearers at M\$4 per pikul.

The Co-operative Mill is a shed of 600 sq. ft. and has no storage capacity. The shares in the mill are held mostly by the people of *Sungei Pērtama*, a few by the richer Malays of *Pērmatang Janggus*, but the mill owns no padi-land, employs only two workers, and does not engage in rice-trading. The Chinese mill at *Pērmatang Pauh*, on

the other hand, covers 4 acres and includes a milling shed of 2,500 sq. ft. and a drying-floor of 4,500 sq. ft. Its grinding machines can mill into the following categories (market prices of July 1954):—

1. Polished Rice	...	... MS\$27 per pikul (25 <i>gantangs</i> ).
2. Broken Rice	...	... \$16 per pikul
3. Bran mixed with Broken Rice	...	... \$13 per pikul
4. Refined Bran	...	... \$13 per pikul
5. Bran with husk	...	... \$ 3 per pikul

This Chinese mill employs 5 permanent and 6 temporary workers, owns 3 padi lots in the mukim (covering 6.15 acres) in the western plain and is financed by five partners.

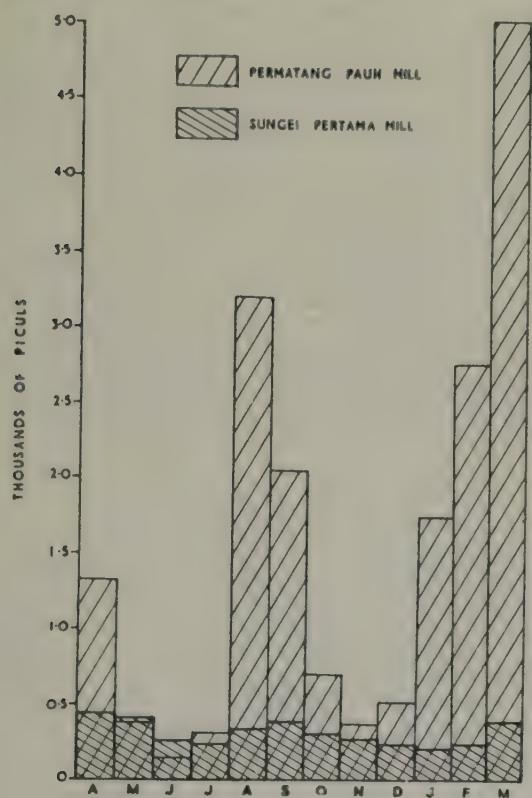


Fig. 4. The monthly consumption of padi by the two mills of Mukim Four during the year April 1953–March 1954. The mill at Pérmatang Pauh is the *Ghee Bee Rice-Mill*, that at Sungai Pertama is the *Co-operative Society Rice-Mill*.

But the difference in volume and seasonal flow between the two mills (Fig. 4) is not due solely to the difference in size; there is also a difference in function between the two mills. The Co-operative Mill works only for personal and immediate consumption of padi by peasants and, as padi keeps better than rice, only about one month's supply is milled at a time; one bag of 32 *gantangs* of padi will give at least 25 *gantangs* of rice. Moreover, this mill is situated at the southern end of the mukim and so functions mainly for Sungai Pertama farmers. Its characteristic is a steady rate of milling at all times of the year. The Chinese mill, on the other hand, centrally placed in the mukim, mills padi from all parts of Mukim Four, and from the adjacent mukims of Kepala Batas, Pénanti and Sungai Dua. It mills some padi for immediate consumption but mills also for trading and its characteristic feature is an uneven flow of work, with peak periods occurring around harvest time. At peak seasons the mill may produce 1,500 pikuls of rice per day. Total figures for both mills for 1952 and 1953 were 16,551 pikuls (413,775 *gantangs*) and 16,775 pikuls (418,875 *gantangs*) respectively.

#### COFFEE FACTORIES

The two coffee factories, both Chinese, are at opposite ends of the main road which runs through the mukim; both are powered by diesel motors. The Ng Choon-thio-factory has been at Sungai Pertama since 1945 but the Lee Gaik-khuan factory came to Pérmatang Pauh from Selama in Perak more recently as a result of the Emergency.

Both factories draw their raw materials from Penang, but the latter (the larger) has its main market in the urban districts of North Perak whereas the former serves the local market.

#### ATAP-MAKING

This is mainly a cottage industry producing for personal or local demand, for atap is the chief roofing material in the mukim. It is made here from the leaves of the nipah palm which are sewn over beams of areca-nut with strips of *bemban* skin. There are twelve small-scale atap dealers here who occasionally hire temporary workers at 10 per cent of the current value of the amount of atap they make. But even the largest of the dealers, though he owns nipah lands and sells atap outside the mukim, produces only 400 pieces a day.

## CHAPTER V

### LAND AND LANDOWNERS

THE INVESTIGATORS found great difficulty in obtaining ownership data for several reasons. In the mukim Register of Holdings, only the name is recorded so that there is no official method of locating the owner of a piece of ground. An attempt was made to get over this difficulty by consulting the *kētua* within the mukim and by having the notice server of the District Office accompany the team for the purpose, but these two devices failed to obtain all ownership data. The problem is the more complex because the fields have nobody upon them for considerable periods and some of the owners do not reside in the mukim. Clearly only a very prolonged inquiry can now elucidate ownership facts for every lot in a mukim and it would appear that the issue, if considered important enough, would merit altering the rules so that the address of the owner be included in the Mukim Register or recorded at the annual payment of land dues. Those lots which cannot be correlated with people residing and working in Mukim Four are chiefly the remoter ones, away from easy connection with the main settlements.

The last change of ownership of every lot examined was abstracted from the Mukim Register. Of 757 lots, including those with no padi, thus examined, over 35 per cent have changed owners since 1945, and these include most of the larger property units in the eastern padi plain. A further feature is that 11 per cent of the lots record no change of ownership since 1905. This must raise considerable doubts about the relation between names in the land register and actual ownership. Plate II shows the location of lots according to dates of last change of ownership and is summarized thus:—

TABLE 9: CHANGES IN LOT OWNERSHIP

<i>Date of Last Change</i>				<i>Number of Lots</i>
Before	December 1904	...	...	95
January 1905—December 1914	...	...	40	
January 1915—December 1924	...	...	71	
January 1925—December 1934	...	...	139	
January 1935—December 1944	...	...	145	
January 1945—August 1954	...	...	267	
				757

#### LAND LOTS

It is a feature of this mukim that the lots of kampong land, whether for residence or for tree-crops, are separate from the padi-lots, and it follows that there is a greater separation of house-lot and padi-lot than occurs in many other parts of Malaya. Upon the *pērmatang*, the region of houses and tree-crops, lots are distinctly smaller than in the padi plains, a common form being a narrow strip at right angles to the road and extending only as far as the padi-land.

Lots are larger and more compacted in the padi plains, but even there the elongated form, arranged on east-west lines, is predominant and probably also related to the direction of the main *pērmatang*. Only to the south near the river are some lots aligned

on quite a different bearing, roughly at right angles to the stream—as in the vegetable holdings of the south-west and near Sungai Pertama. The largest individual lots are in the eastern plain where there are nine padi-lots exceeding 10 acres each.

In the absence of titles containing addresses of owners, the team had to rely on local statements of their whereabouts. Of the 757 lots, 618 are the property of people living within this mukim or in the immediately adjoining ones (i.e. Mukims 2, 5, 6 and 7); 77 lots, totalling 229 acres, have owners living in some other part of Province Wellesley; 35 lots, totalling 147 acres, are owned by people on Penang Island; and 27 lots, totalling 65 acres, by people in parts of Malaya outside Penang and Province Wellesley (Plate 12). It appears, therefore, that absentee ownership is a term correctly applicable to 139 lots (441 acres) out of the total of 757 covering 1,969 acres; that is, 19 per cent of all lots, covering 22 per cent of the total acreage of the mukim, have absentee landlords. Owners in Penang account for some of the largest blocks of padi-land in the east, and it is to be observed that absentee ownership applies largely to less accessible lots. Of those living in other parts of Province Wellesley and owning property in this mukim, only about 5 per cent are non-Malay; similarly, of absentee owners living in Penang, less than 4 per cent are non-Malay.

On 186 lots covering 370.2 acres of padi-land (i.e. 24 per cent of all padi-land in this mukim), it is reported that they are owner-worked (Plate 13). This includes 144 Malay households owning and working an average of about 1½ acres each and 42 Chinese households averaging about 3½ acres each. The largest blocks of owner-worked land are in the north-east near Bukit Pelandok and Bukit Merah.

It follows that about 1,100 acres of padi in this mukim are owned locally (by residents either of this or contiguous mukims) and worked by others, largely drawn from this mukim though some from outside it are also engaged. This acreage includes lots in which owners hire labour for working their fields and those which are rented out. Our questionnaires show that a total of 536 acres of padi (that is, one-third of all padi-land within this mukim) are rented, the terms being cash rent for over 70 acres of this area, the rest being let in kind. The local terms are about M\$110 annually per acre in cash or one-third of the *malayan* padi crop. Where the rental is in kind, the farmer pays 46 *gantangs* per acre if he produces a second (*taiwan*) crop. Apparently there is a local convention of elasticity in these proportions which are varied where hardships such as a bad year can be proved. The whole rental system has a vagueness and flexibility difficult to record accurately because agreements are always verbal and on a year-to-year basis. "Working the land satisfactorily" is the understanding, and it would appear that both parties have a safeguard in the convention by which controversies between owner and tenant are settled at a meeting of the local headmen, the elders and the local religious teachers. As Plate 14 indicates, all the land held in vegetables (68.7 acres) in the south-west corner of the mukim is rented in cash. According to an official source<sup>1</sup> the value of land in Mukim Four has risen to three times its price before the last war, due to the irrigation works, particularly since 1949. It is also claimed that as a result of these facilities all land in the hands of money-lenders has been redeemed and all available land taken up.

Change of tenancy takes place when neglect by the lessee is proved and when another offer at higher rates is made. There is thus a pressure to maintain high yields and a competition among the landless. Anxiety on this score was reportedly becoming

1. Settlement, Drainage and Irrigation Engineer, Penang.

general now that landlords are increasingly seeking rents in cash and want payment in advance. This exposes farmers in the western plain to the whole risk associated with their unirrigated crops.

According to the replies received, 47 households are dependent on the 70 acres rented in cash; 28 of these households are Malay. Regarding the 466 acres rented in kind, only 42 of the 253 households engaged are non-Malay. Owing to the complexities arising from absenteeism, from the difficulty of identifying names, from the custom of husbands claiming ownership of their wives' properties, and from failure to register changes in effective title, how many lots of the rented land are held by single householders is generally difficult to trace. Nevertheless, it is clear from the questionnaire and from the *penghulu* that 15 individuals effectively hold padi property of more than 10 acres each, their total accounting for about 277 acres altogether. The owners of the two largest areas are Malay and, out of the fifteen persons—each with holdings exceeding 10 acres—10 are Malay. The average size of these large Malay holdings is 19.2 acres and that of the Chinese 15 acres each. Five persons each own over 20 acres in the mukim, four of them being Malay, and their properties are characteristically in many lots.

From another point of view, it is found that 427 householders in Mukim Four own no land either directly or through members of their household, 37 own land but do not themselves work it, 243 neither own nor work on the land, while three own some land but also work on the land of others. Landless agricultural householders include roughly an equal number of Malays and Chinese; 32 of those owning but not working their land and about 60 per cent of those neither owning nor working land are Malay.

The worker-landowner structure is dominated by two patterns: the Malay worker for a Malay owner (218 lots) and the Chinese worker for a Malay owner (61 lots) (Plate 15).

The racial pattern of worker-owner relations can be illustrated by comparing the race of those working in fields outside the kampong and off the *pérmatang* (as labourers or as tenants) with the race of the owner according to the mukim register of titles. On only three lots (6.8 acres) are Malays working the land for Chinese owners and on only two are they doing so for Indian owners (6.3 acres). On 218 lots totalling 292.2 acres Malays are working the land for Malay owners who appear to have no family relation with them. Chinese workers are engaged on 61 lots of Malay-owned land totalling 179.6 acres, mostly in the more remote parts of the mukim and including over 50 per cent of the vegetable area in the south-west, and on 4 lots of Indian-owned land covering 10.5 acres. Chinese workers on Chinese-owned land (totalling 8 acres) number nine.

## CHAPTER VI

### SOCIAL ACTIVITIES AND COMMUNICATIONS

#### HEALTH

IN THIS low-lying area of restricted natural drainage, houses are never more than 150 yards away from stagnant water, such as the *bemban* swamp between Pérmatang Janggus and Pérmatang Pauh (Plate 3). Again, a narrow strip of swampy ground borders the padi-field on the eastern side of Pérmatang Janggus, and in all the villages there are pools of dirty water. As in other Malay kampons, the houses are surrounded by a small bare patch, and where houses are crowded together, as in Pérmatang Janggus and Pérmatang Pauh, this bare ground, relieved only by scattered fruit trees, stretches through much of the village. Where it is fairly clean, few insects breed, but they do so in large numbers in the swamp patches and pools of dirty water. Yet most of the mosquitoes appear to be of the nuisance variety only. Malaria here has apparently been changed to an endemic burden with little impact on the lives of the people, for in one year at Sungei Pérnama only 27 cases of unclassified malaria were treated by the travelling dispensary (Table 10), in spite of the fact that the mukim is a non-protected area for malaria.<sup>1</sup>

The figures given in Table 10 do not, it must be emphasized, give a true picture of the health conditions of Mukim Four. Apart from the certainty that cases from Mukim Six were treated, a much greater proportion of Chinese than Malays make use of the dispensary. Moreover "more and more people are coming to the dispensary for treatment, especially of external ailments, but I still believe that many of the more serious cases are treated in their own houses."<sup>2</sup>

TABLE 10: CASES TREATED AT SUNGEI PERTAMA, BY THE BUTTERWORTH TRAVELLING DISPENSARY FROM JULY 1953 TO JUNE 1954

New Cases	...	...	...	562
Repetitions	...	...	...	388
				950
Malays	...	...	...	616
Chinese	...	...	...	325
Indians	...	...	...	9
<i>By Diseases (new cases only)</i>				
1. Ulcers, Sores, Ringworm, Tinea and other skin complaints	...	...	...	151
2. Acute Bronchitis, Chronic Bronchitis and Bronchitis unclassified	...	...	...	99
3. Worm infestations, Ascariasis, etc.	...	...	...	46
4. Acute Conjunctivitis	...	...	...	42
5. Otitis, Media and Externa	...	...	...	36
6. Malaria unclassified	...	...	...	27
7. Others	...	...	...	121
				522

1. Information from the Health Officer, Province Wellesley.

2. Health Assistant, Butterworth.

## SANITATION

The disposal of sewage and refuse is difficult in this low-lying, water-sodden area. The Sungai Dēthaka, especially the tidal portion, is useful, but otherwise most houses have shallow cesspits, often communal and placed towards the edges of the pērmatang (Plate 16). There is sometimes a small hut above the pits, but others are open or surrounded by a wall of coconut fronds. Some shops and a few houses have bucket lavatories, one to each shop or house, the night soil being removed once in three days.

## DOMESTIC WATER SUPPLIES

There is no pipe-water in the mukim,<sup>1</sup> but there are 422 wells (Table 11), most of which are over 5 ft. deep (Plate 17). The deepest wells, of 10 ft. or more in depth, are chiefly on the higher parts of the pērmatang, notably in Pērmatang Pauh. In Pērmatang Janggus, Pērmatang Pauh and Pērmatang Tēngah the well water is clear and rarely dries up even during droughts. In Sungai Pērtama, Bagan Sērai and other lower areas, however, the wells do dry up regularly and force the villagers to fetch water from other parts of the main permatang. Chinese in the south-western district go to Sungai Pērtama or Pērmatang Janggus for their drinking water: they have paid to construct a concrete path to facilitate movement from the vegetable gardens to the RIDA well at Pērmatang Janggus. Plate 17 shows the distribution of wells and indicates the movements (regular and occasional) for drinking water. It will be seen that there is no movement at all from or to Hutan Nibong, Bukit Pēlandok or Bukit Merah where local supplies are adequate.

The depth of water in all the wells differs considerably before and after heavy rain. An hour or two of heavy rain gives a rise of two or three feet of water in the wells, most of which are supplied by seepage, so that their location in relation to houses and lavatories is of vital importance to health (Plate 16).

TABLE 11: CLASSIFICATION OF WELLS BY DEPTH<sup>2</sup>

Depth in feet			Number
0—4·5	...	...	28
5—9·5	...	...	294
over 10	...	...	100
			—
			422
			—
	Total number of houses ...		815

In Hutan Nibong earth wells (simple open pits) provide all drinking, as well as other water, but elsewhere earth wells are used only for washing and bathing. Concrete wells, those lined with brick and mortar and those formed by a number of concrete pipes sunk into the ground, provide the drinking water. But to construct even a cheap concrete-pipe well (cost M\$30) is impossible for many villagers, and only 42 per cent of the households have their own drinking well. The Government and RIDA have constructed two wells each for the whole mukim. The Government wells are at Pērmatang

1. The nearest pipe for water is 2½ miles south of the mukim.

2. The depth of the well, not of the water in it.

Tengah and Simpang Tiga. RIDA sank its wells in 1953, the one at Pérmatang Janggus, mainly used by Chinese vegetable gardeners, the other fifty yards away from Sungai Pérmatang. The latter well has never been used because its water is brackish and muddy.

### SHOPS

Of fifty-five shops in the mukim (Table 12), all except five are located along the roads. There is no shop either in Bukit Merah or Bukit Pélundok, in the south-western or the south-eastern settlements. But there are two concentrations of shops, one at Sungai Pérmatang in the south and the other, the more important, in the north at Pérmatang Pauh village (Plate 18). Table 13 shows that Hokkiens are the main shopkeepers in the mukim.

Most needs of the villagers can be met by the shops here, many of which accept padi in payment for goods taken. Five of the shops in the village have drying floors to deal with such padi, though this must be partly attributed to the fact that some shopkeepers also own padi-fields. The shops also accept in small quantities coconuts and eggs in exchange for oil, salt or sugar. Taking goods on credit until the next harvest is also a common practice. Payment is made immediately after harvest and can either be in cash or in kind, that is, in padi. In practice, the latter is more common.

All shops except one are owned and managed by the proprietors themselves with only family help. The exception is the Co-operative Store in Sungai Pérmatang, which is managed by two Malays. Thus the shops offer little opportunity for employment.

TABLE 12: CLASSIFICATION OF SHOPS BY TYPE AND BY RACE OF OWNERS

<i>Types of Shop</i>	<i>Malay</i>	<i>Chinese</i>	<i>Indian</i>	<i>Total</i>	
Coffee Shop	...	2	5	2	9
Provision Shop	...	7	23	1	31
Tailor's Shop	...	—	4	—	4
Bicycle Repairs	...	—	2	—	2
Barber	...	1	1	1	3
Chinese Medicine	...	—	2	—	2
Silver Smith	...	—	2	—	2
Butcher's Shop	...	—	1	—	1
Timber Store	...	1	—	—	1
<hr/>					
Total Shops	...	11	40	4	55
Total Houses	...	560	229	26	815
Proportion of Shops to Houses	1.96	17.47	15.38	6.75	

TABLE 13: CLASSIFICATION OF CHINESE SHOPS BY DIALECT OF OWNERS

<i>Dialect of Shopkeeper</i>	<i>Number of Shops</i>
Hokkien	...
Cantonese	...
Hainanese	...
Keh	...
Tiechiu	...
<hr/>	
	40
<hr/>	

## MOSQUES AND SCHOOLS

Though seven religious buildings are indicated in Plate 18 and all are Malay, only three are proper mosques, the other four being *surau*. Two of the mosques are in Sungai Pertama, the other in Permatang Janggus, but Permatang Pauh is served by a mosque lying just outside the mukim boundary.

The schools, like the mosques, are mostly in the south. Sungai Pertama has two schools, one Malay and one Chinese, while Permatang To'Kandu has one Malay school. There are no other schools in the mukim but Permatang Pauh children are served by schools (one Chinese and one Malay) just outside the mukim boundary.

## COMMUNICATIONS

Most of the houses in the mukim are strung out along both sides of the main north-south road which joins another metalled road forming the northern boundary of the mukim. Indeed, all the houses in the mukim, except 70 Chinese houses in the north-east, 48 Chinese houses in the south-west and 18 houses at Hutan Nibong, are within 400 yards of a main metalled road. Movement between houses in the mukim, then, is not especially difficult, only Hutan Nibong being badly served in this respect, for it has no distinguishable pathway to the main north-south road. However, the pattern of house-land relationship in the mukim means that most farmers have to walk a long way through padi-fields to get to their place of work. And this means using *batas* and paths which, unless in proper repair, make the going difficult. Plate 20 shows the distance of movement to work of householders in a section of Permatang Janggus; 32 per cent move more than 1,000 yards, 37 per cent between 500 yards and 1,000 yards, and 31 per cent less than 500 yards from their houses to work in the padi-fields.

Two traffic check-points were established, one along the Kubang Semang Road at the eastern limit of Permatang Pauh village, the other along the north-south road near the southern limit of the mukim. The volume of traffic in the second instance was naturally far greater since it is a main trunk road, but the pattern of movement, less affected as it is by through long-distance traffic, is more complex at the northern check-point (Fig. 5). This road, the Kubang Semang Road, leads eastwards to Penanti and

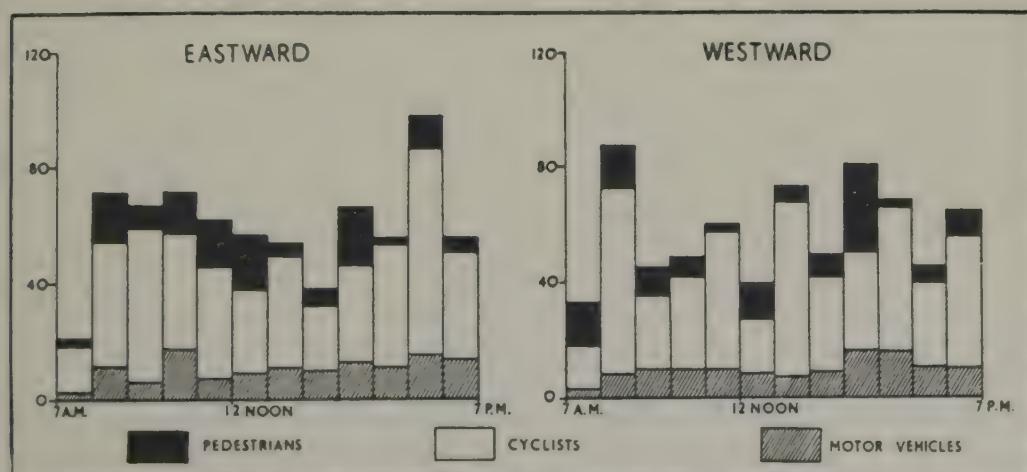


Fig. 5. Traffic on the road forming the northern boundary of Mukim Four.

immediately to the east of the check-point padi-fields line the road on both sides. Very little vehicular traffic was counted, too little, in fact, to distinguish any rhythm of movement. Cyclists formed easily the most important means of transport along this road. There was no great fluctuation of movement but the early morning (8-9 a.m.) eastwards peak consisted chiefly of padi-planters going to their fields, the evening (5-6 p.m.) peak was largely accounted for by the return of these men to the permatang settlements. The bicycles, useless on the soft earth of the *batas* when the fields are wet, can be left on the side of the road nearest to the planter's padi-lot.

PART THREE  
MUKIM DULANG, KEDAH



## CHAPTER I

### THE PHYSICAL ENVIRONMENT

**MUKIM DULANG** is a coastal part of the Kedah Plain situated a few miles to the north of Gunong Jérai (Kedah Peak, 3,992 ft.). Three of its boundaries are clearly defined on the ground by watercourses and the sea, but the southern boundary is an arbitrary line separating Mukim Dulang from Mukim Yen (Plate 21). The mukim, covering an area of 9.05 sq. miles, is divided from east to west by Sungai Dulang Kéchil (Plate 22). No metalled roads cross the mukim, and internal movement is by footpaths, which are also the only links to (1) the main road from Alor Star to Butterworth, which passes two miles to eastward of the mukim limit, and (2) the secondary road from Yen to Guar Chémpedak, which runs half a mile south of the southern boundary of the mukim.

The area slopes gently seawards (7 ft. in 5 miles) from east to west and even more gently (1 ft. in 2½ miles) from south to north. The only river is Sungai Dulang Bésar, though this has been considerably straightened. Sungai Sédaka and Sungai Dulang Kéchil are canals, and Sungai Sélinkoh is a canalized continuation of Sungai Téroi. Sungai Sélinkoh flows from south-south-east to north-north-west; otherwise the water-lines run from east to west, and Sungai Dulang Bésar is joined 700 yards from the coast by a moribund watercourse called Sungai Mati, once an outlet of the Dulang Bésar. Flat, water-logged country like that of the mukim extends south, east and north of it: westward lies a gently shelving shore, wide stretches of which are exposed at each low tide, when the sea-edge retreats for a hundred yards or more.

One small pérmatang (p. vi above) is recognizable in the mukim. It is situated in the south-west and extends into Mukim Yen. But it is possibly not wholly a natural feature for part of the northern end is said to have been artificially built up. Two artificial bunds in the north-west corner of Mukim Dulang, near Kampong Sédaka Kéchil, serve to keep the sea from entering fields near the coast. Apart from these features, trees alone serve to diversify the prevailing flatness of the landscape.

The water-table in the mukim is high, more than 85 per cent of the wells having a water level less than 1½ ft. below the surface of the ground at the time of the survey (June to August 1954). Three-quarters of Dulang is under at least six inches of water during the wetter season, when some places (those, for instance, along the Sungai Sédaka) are flooded to a depth of as much as three feet.

The fields become dry after the padi harvest in February, when cracks and fissures appear on the surface of the ground. At this time of the year most of the wells dry up. At the eastern end of the mukim it was remarked that deepening the wells does not solve the water problem in the dry season because at that time the deep water is sour. The quality of ground-water improves westwards towards the centre of the mukim, but nearer the coast it is affected by the seepage of sea water. Tidal influence is felt as much as one and a half miles inland along Sungai Dulang Bésar, Sungai Dulang Kéchil and Sungai Sédaka, and for this reason wells must be sited well away from watercourses. Wells dug near the canals contain brackish water: those dug about 100 to 150 yards away from the canals commonly have potable water.

The two lines of water in the mukim are the canals Sungai Dulang Kechil and Sungai Sedaka. Two sluice-gates help to maintain levels in the streams by preventing run-off and by holding back the tidal inflow. However, this supply system sometimes fails in certain parts of the mukim because the peasants, once the water has gained entry into the fields, seem unable to retain it there, and the water seeks an outlet through the surrounding padi-fields. Moreover, water from the canals cannot reach the whole mukim, but only benefits adjoining lots. The level of the Sungai Dulang Besar is normally not high enough for irrigation. Its water is usually stagnant and flows only after heavy showers, and the mouth of the stream is heavily silted. Dependence on rain water is the rule rather than the exception in Mukim Dulang and the water-lines are more for drainage than for irrigation, though when water levels are high what is drained from one zone becomes available for irrigation in another.

Situated in the north of Malaya, the area experiences a nearer approach to a dry season than is found further south in the peninsula. Its total annual rainfall averages 118 in. The wettest months are September and October, the driest are January and February, with a secondary maximum in May (Fig. 6). These average conditions mean less to the padi farmer than the actual incidence of rainfall in any one year. How far the rainfall can vary from year to year is clear from Fig. 7 which shows the rainfall for four consecutive years at Alor Star (20 miles north of Dulang). The length and timing of the wetter and drier periods may vary significantly and this has serious repercussions on the wet-farming in Dulang, where there is little safeguard against fluctuations of direct rainfall.

Temperatures change little throughout the year, averaging 80° F. and with a mean diurnal range of 15°–20° F.



Fig. 6. Average monthly rainfall at Dulang.

No soil analysis has yet been made in the area, but distinct variations in soil colour and condition are evident to the eye. In the east, where the land has been cultivated for a longer period, the soil is lighter in colour than in the west. Along the coast the soil consists of a sticky, muddy clay, with a six- to nine-inch layer of partly decomposed sea-shells lying at a depth of about one foot below the surface. It was not possible to delimit the soil varieties nor to check whether marine shells occurred in soils further inland.

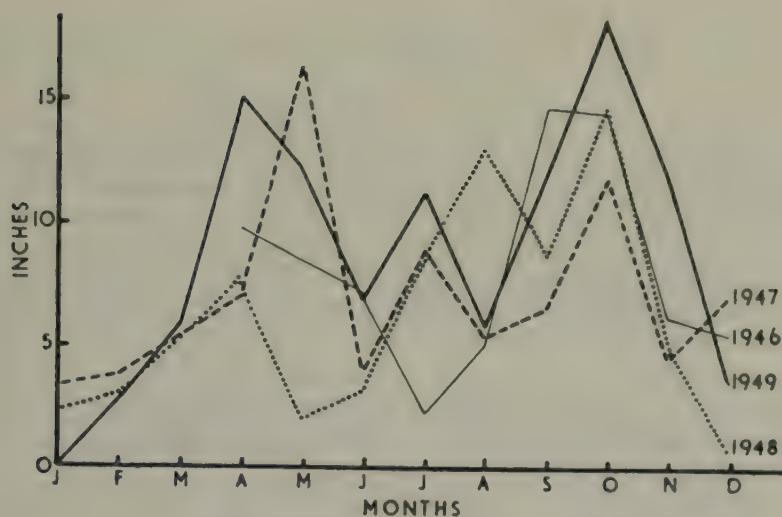


Fig. 7. Rainfall variation at Alor Star. From B.W. Hodder, "Bio-geographical Aspects of Settlement in Malaya", in this Journal, vol. 5 (March, 1955), p. 18.

Only along the coast is natural tree vegetation found: *nipah* (*Nipah fruticans*), *gēlam* (*Melaleuca leucadendron*) and *api-api* (*Avicennia officinalis*). This swamp vegetation is discontinuous from north to south and penetrates farthest inland around the mouths of the water channels (Plate 22). Inland only small patches of this kind of vegetation are found, but older members of the mukim claim that the area was formerly covered by stands of *gēlam*, mangrove and other forest trees such as *Mahang* (*Macaranga*). Small patches of *bēlukar* and occasional clumps of giant bamboo remain at a few spots.

## CHAPTER II

### POPULATION AND SETTLEMENT

WITH A TOTAL recorded population of 4,120,<sup>1</sup> and an area of 9.05 sq. miles, Dulang has an average density of 455 persons per sq. mile, yet the house distribution is uneven (Plate 23). The dominant settlement pattern in the eastern three-quarters of the mukim is linear, but in the western or coastal quarter the pattern is more dispersed. The settlements can best be examined under the following headings (1) Linear settlements along canals and streams, along pērmatang and bunds, and along the coast and (2) Dispersed settlements.

1.—(i) It is necessary to distinguish between settlements along canals and those along streams, for in detail the siting is different. In canal settlements, the houses are built close to the edge of the canal bank, usually within 22 yards (Fig. 8). Examples are to be found along Sungai Dulang Kēchil, Sungai Sēlinkoh and Sungai

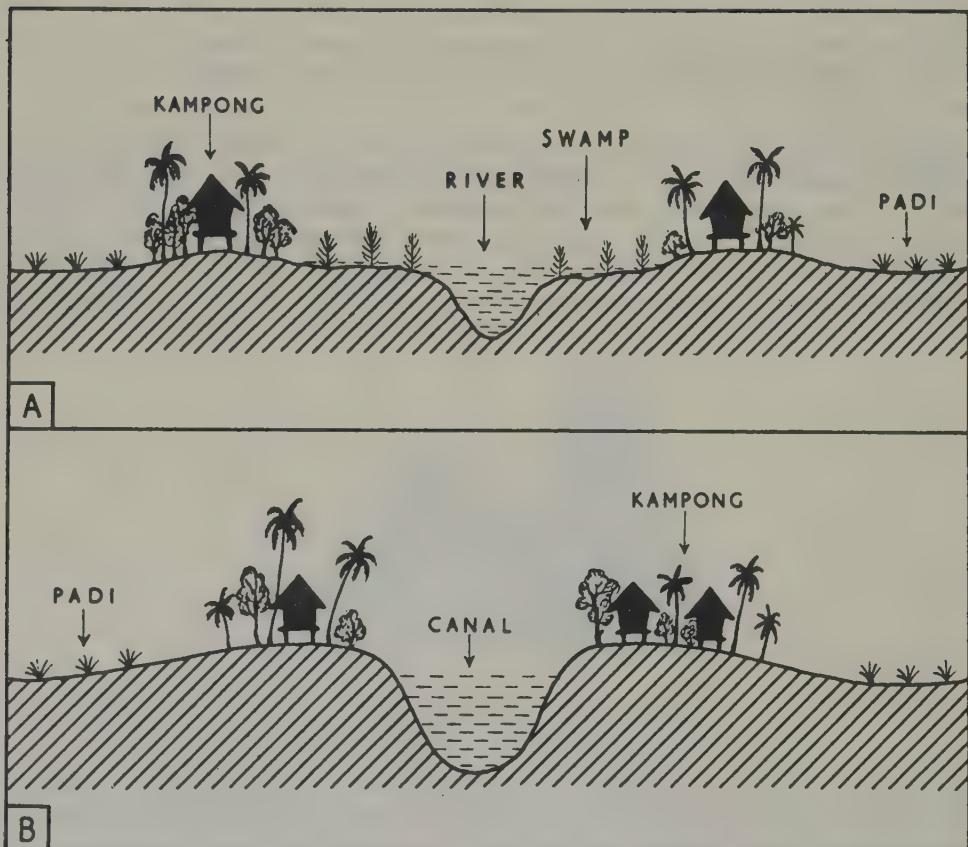


Fig. 8. Contrasting settlement sites along canals and rivers.  
A. Bordering Sungai Dulang Bēsar.  
B. Bordering Sungai Dulang Kēchil.

1. Information obtained by a house-to-house count.

Sēdaka. Houses can be built thus because the banks are artificially raised and, because the canals are controlled to discharge most in the wettest seasons, rarely covered by flood water.

(ii) Along natural streams such as Sungai Dulang Bēsar, on the other hand, swamp often lines the banks which are less emphatic, lower and gentler in slope. Riverside houses must for safety and comfort be sited some 2-2½ chains from the edge of the stream.

(iii) Along the coast there are small areas where the houses are aligned in a north-south direction, contrasting with the east-west alignment found in the eastern portion of the mukim. One such group of houses lies along a bund of the sea-wall type in the north-west.

(iv) The one pērmatang settlement in the area is Kampong Kēlantan, built on the northward extension of Pērmatang Sērantang from Mukim Yen.

2.—Dispersed settlements noticeably occur in lots distant from watercourses. In the south-east and east such dispersed houses are mainly Chinese, and are set in large lots rented out to a number of families. For example, Lot 212 contains eleven families, all Cantonese, who work an area of over 91 acres; each householder has built his house in the middle of his particular field. In the west of the mukim dispersion appears related to the small size and irregularity of the lots in the recently settled part of the padi area.

#### RACIAL COMPOSITION

The population of Mukim Dulang consists chiefly of Malays (Table 14).

TABLE 14: RACIAL COMPOSITION OF THE POPULATION

		Male	Female	Children under 12	Total
Malays	...	1,099	1,123	1,612	3,834
Chinese	...	100	75	109	284
Pakistanis	...	1	—	—	1
Siamese	...	1	—	—	1
		1,201	1,198	1,721	4,120

Malays form 93 per cent of the total population and their adult sex-ratio is close to parity. They are homogeneous to the extent that 97 per cent of the total Malay population (by households) are described as Kedah Malays. Plate 24 indicates that, of the 25 non-Kedah Malay households, 17 are in the west-central portion of the mukim. Apart from three Indonesian households, all non-Kedah Malays originate from North Malaya: 9 from Penang, 5 from Kēlantan, 4 from Perlis and 4 from Perak.

The South Chinese concentrate in the east and south of the mukim (Plate 24), only 7 out of their 70 households being on the coastal side of the Yen Kēchil path through the mukim. Of this community 70 per cent are Cantonese, all of whom live to the east of the path. The rest are Hokkien, except for one Tiechiu and two Hakka households. The adult sex-ratio of the Chinese is 75 women to 100 males.

## POPULATION DYNAMICS

According to local headmen, the area was settled between twenty and thirty years ago after major drainage works had been completed. Four hundred and fifty-six households have been in their present houses for less than ten years; 426 have been there for more than that period. This feature of late development is accompanied by signs of recent depopulation. The 1947 Census Report gives a total mukim population of 4,214,<sup>1</sup> which is 94 more than that recorded by our investigators in 1954. The decrease over seven years implies a loss of 56 Chinese and 38 Malays. A similar trend was evident in the number of houses; 905 (20 unoccupied) existed in 1954 against 946 (all occupied) in the 1947 Census. No evidence was available as to whether the net depopulation over the last seven years was related to emigration or to changes in mortality and birth rates. The same decline showed in the figures provided by the *pēnghulu*, though these suggested a more marked decrease than did those obtained by house-to-house enquiry. According to the *pēnghulu*, in 1953 the population of the mukim was 3,679, representing a decrease of 535 between 1947 and 1953.

Three reasons for this depopulation are advanced locally: the shortage of farming land, the increase in rents and the attraction of the Tanjong Karang colonization in Selangor. Krian is said to be still absorbing most emigrants from Mukim Dulang, though the younger ones have moved to the towns and the security forces.

## HOUSE TYPES

Malay houses on piles and Chinese and Indian houses built directly on the ground are all evident in the mukim landscape. The Chinese house has a beaten-earth floor about 1½-2 ft. above the surrounding land, wooden walls and an atap roof. The Malay house, on the other hand, varies more in its materials, which include wood, bamboo, atap, corrugated iron and cement. The floor space for each person is less among the Malays than among the Chinese, with an average for each resident of 62.5 sq. ft. in a Malay house and 98.5 sq. ft. in a Chinese house. A wide range in quality of houses is also seen, from well-appointed, large Malay houses to squalid little shacks.

1. M.V. del Tufo, *A Report on the 1947 Census of Population* (London, 1949), p. 153.

## CHAPTER III

### PADI

ON THE basis of our enquiries 85 per cent of Mukim Dulang (4,953 out of 5,792 acres) is devoted to the growing of padi<sup>1</sup> and 92.4 per cent of the total working population are padi-planters. This mukim is, therefore, under a virtual monocultivation. The present pattern of land use, according to official estimates, is as follows:—

Bēndang (padi-fields)	...	...	5,066 acres.
Kampong	...	...	63 acres.
Coconuts	...	...	2 acres.
Rubber	...	...	34 acres.

About one-third of the *bēndang* land, it is said, went out of cultivation during the Japanese occupation, when many planters were drafted into the services and it was feared that crops would be confiscated. Today the acreage under padi is roughly at the pre-war level, so that cultivation has fluctuated considerably over the last twelve years or so.

#### FIELD PROCESSES

##### *Seeding*

In choosing the site for his seed-beds, the farmer takes into consideration the water-level in the off-season. He seeks a site accessible to houses while at the same time safe from ducks. It is the local custom to choose a central position in the field so that carrying is minimized, a practice which makes for a dispersed seed-bed distribution (Plate 25). The planters claim they prefer clayey soil for seed-beds in order to safeguard the rootlets during transplanting.

All except about a dozen of the seed-beds in the mukim start as floatable seed-beds (*sēmai rakit*). The bed is built with decayed grass or clay and soil overlying banana or similar large leaves, so that it can float if at any time there is too much water. It floats only occasionally and does not to any extent move sideways. The seed is first soaked for 72 hours to induce sprouting, and is then transferred to the bed. A grass (*rumput nyolok*) is used to cover the bed to protect seedlings from sparrows and other birds.

After about the ninth day, the young padi is transferred from its floatable seed-bed to a permanent seed-bed near by. Henceforward it is liable to attacks by rats and caterpillars, and ducks must be kept away, usually by a temporary fence around the bed. Sometimes old fishing-nets are used to protect the plants. Weeding is necessary because in Dulang the grass *rumput nyolok* grows quickly.

In this mukim a dozen or so ordinary seed-beds (or *sēmai tapak*) exist at places where the floatable seed-bed stage is omitted. Only in areas where flooding seldom occurs is this method safe, and the farmers who use it come chiefly from the Kota Star district further north, where the floatable seed-bed technique is uncommon. Three Chinese farmers in Lot 926 who use only the permanent seed-bed say they can safely do so because their land is slightly higher than its surroundings.

1. The official local estimate of padi-land is 5,066 acres, which is one per cent more than that of the University investigators.

### Field Preparation

After seeding, the farmer spends from forty to fifty days clearing and preparing his *bēndang* for transplanting. Four methods are used:—

(1) *Tajak kapar*. First the farmer clears his land with a *tajak*, one acre of *bēndang* taking five and a half days to complete. The grass rots for at least six days and is then gathered roughly into rows to ferment it into grass manure. The rows are turned several times to make sure that the grass rots sufficiently, and then the manure is spread over the field. The levels in relation to standing water are then so critical that too much grass manure may raise the level of *bēndang* and reduce the depth of water, in which case the farmer may have to plant his padi between the rows of green manure, even though this encourages pests, especially rats. Because no buffaloes are needed, this is the cheapest method of field preparation and is practised exclusively by farmers working in small rented fields. It is commonest where the ground is very soft and the surface water excessive, as in Dulang Bēsar and Kampong Kēlantan.

(2) *Tajak giling* is the most popular practice in Mukim Dulang, about seventy per cent of the farmers using it. After the *bēndang* has been cleared by slashing (*tajak*) and the fallen vegetation, grass and *mēnderong*<sup>1</sup> allowed to rot for eighty days, a roller is used to hasten disintegration. A farmer can roll one acre in eleven hours. Rolling must be repeated at least six times at intervals of five days before the grass is rotted completely. A few farmers rent buffaloes for this work.

(3) *Ploughing*. The plough (*tēnggala*) is not popular in Dulang, except in Ulu Sēlinkoh where ten out of thirty-nine farmers use it. Besides the plough itself, which here costs M\$100, a buffalo is needed. Because the ground is often very soft, the plough is apt to lower the level and produce conditions considered too muddy for good padi. Another factor limiting the use of the plough is the presence of tree stumps, notably in Ulu Sēlinkoh. At least sixty farmers asserted that by using the plough they thought they might increase their padi production.

Occasionally, as in Dulang Bēsar, slashing and ploughing techniques are used in alternate years. By this means the farmer hopes to prevent the land from becoming too hard (due to the continual use of the *tajak*) and too soft (due to the continual use of the plough).

(4) *Hoe and Plough*. The use of the large hoe (*changkul*) for preparing the fields is not popular in the mukim except for repairing bunds. Chinese farmers in Lots 936 and 928 use the *changkul* in combination with ploughing and slashing.

### Transplanting

Farmers in this mukim as far as possible try to transplant simultaneously with one another. The Government issues a directive for Kedah State as a whole (not specifically for this one mukim) regarding the dates on which field activities, including transplanting, should be started and completed. This is taken as only a guide by the villagers and not strictly enforced. Local conditions and the farmer's own personal circumstances determine the exact time of transplanting, which is usually at the end of July or the beginning of August, that is, when the young plants in the seed-bed are altogether about sixty days old.

Mutual aid (*bērdērau*) in the work of transplanting is common. A group of twenty or thirty farmers will together begin pulling the young padi from the seed-beds. Young

1. The sedge *Scirpus grossus*.

shoots are gathered into small bunches of 10 in. diameter and then distributed in the *béndang* for transplanting, mainly by women. Those who do not adopt the mutual or communal aid system have their *béndangs* planted for M\$21 per acre. Ten days after planting, any dead sprouts are replaced (an operation known locally as *ményulam*). Thereafter the farmer does little except weeding or visiting the field to check on pests, but it can safely be left without much further fear after the padi is two months old.

### Harvesting

By the end of February the padi ripens and harvesting begins. The stalk is cut by women and threshed in the field by men. After being threshed into a wooden stalk is cut by women and threshed in the field by men. After being threshed into a wooden trough set in the field, the padi is winnowed whenever strong winds blow. A buffalo-sledge drags the padi in sacks to the mill, *jelapang* or other padi store. The padi stores are invariably built close to the house so that their distribution (Plate 26) is closely related to that of houses.

The mutual aid system is also used in harvesting, though hiring extra labourers for cash is common. A few reports of payment in kind were also received. Altogether 3,251 (3,196 Malays and 55 Chinese) "friends" were reported to be engaged in the *bérdérau* system each year, 1,830 labourers (1,448 Malays, 382 Chinese) were hired as field workers for cash payments, and 105 (all Malays) paid in kind.

### PADI TYPES

Two types of padi are used: six-month strains such as *Mayang rambai* and *Mayang bongor* for places where only shallow water lies on the fields, and eight-month strains like *Radin* for areas with deeper water. A small section (rarely exceeding 0.2 acres at a time) of many fields is devoted to glutinous rice (*pulut*) and is essential in the *bérdérau* system, because the friends giving their work are customarily supplied with a breakfast of curry and *pulut* with coffee.

### YIELDS

On the basis of answers received, the average yield of the mukim is calculated to be 330 *gantangs* per acre. The estimates for each lot as given by farmers are mapped in Plate 27, though their figures of yields are subjective because they rarely keep accurate records of their production. The higher yields were reported largely from owner-worked lots (compare Plates 27 and 31).

TABLE 15: CORRELATION OF YIELDS WITH OWNER-WORKED LOTS

Reported Yield per Acre in Gantangs	Owner-worked lots as percentage of total farms with such yield				
Less than 230	...	...	...	...	36.3
230—343	...	...	...	...	38.3
344—457	...	...	...	...	46.8
458 and over	...	...	...	...	59.4

Table 15 suggests that the lower yields may be understatements made by tenants to mislead landlords.

An official yield for the mukim is calculated by the *pénghulu* who arbitrarily selects two plots measuring 44 ft. by 22 ft., one in what he considers a high-yielding locality, the other in a low-yielding locality: the mean of these is assumed to be the average

local yield and the local production calculated as a multiple of this. Estimates for the agricultural year April 1953 to March 1954 for the sub-divisions of Mukim Dulang are given in Table 16.

TABLE 16: PADI YIELDS IN MUKIM DULANG, APRIL 1953—MARCH 1954

Sub-division		Area (in Acres)	Yield per Acre (gantangs)	Production (gantangs)
1. Ulu Dulang	...	994	450	441,600
2. Kampong Bham	...	497	450	224,000
3. Sungai Lintang	...	284	479	136,400
4. Ulu Sédaka	...	337.25	493	166,250
5. Simpang Ampat	...	433.1	450	188,800
6. Sédaka (including Kg. Jawa)	...	504.1	493	227,500
7. Kuala Dulang Kéchil	...	426	422.5	180,000
8. Kuala Sédaka	...	152.65	422.5	64,500
9. Batu Anam	...	213	493	105,000
10. Dulang Bésar	...	710	422.5	273,000
		4,551.1		2,027,050

The yield for the mukim as a whole is officially estimated at between 430 and 500 *gantangs* per acre.

The factors preventing higher yields are given by the peasants as (i) pests (adduced by 515 padi farmers), (ii) insufficient water (by 9), (iii) excess water (by 10), and (iv) salinity (by 13).

Plate 28, which shows the distribution of fields reputedly troubled by such factors, indicates that while salinity is the main cause of lower yields in the western coastal areas, and insufficient water in parts of the west and the east, excess water is the chief deterrent to high yields in the south-centre (Dulang Bésar).

Calculating from the data provided by householders, the total production of the mukim for the agricultural year ending March 1954, is 1,644,900 *gantangs* of padi, which is substantially less than the official estimate of 2,057,050 *gantangs*. These figures can be compared with the total reported capacities of various types of padi stores in the mukim, namely 864,320 *gantangs* for all Malay stores, 84,160 for all Chinese stores, giving a total capacity of 948,490 *gantangs* (Table 17). Some local production will, of course, be going to stores in adjoining mukims.

TABLE 17: CAPACITIES OF PADI STORES

Type of Store	Jélapang	Kérebong	Békas	All Malay Stores	All Chinese Stores	All Stores
Total Capacity in Gantangs	806,080	38,720	19,520	864,320	84,160	948,490

The dominance of *jélapang* among Malays is a matter of tradition but seems related to the advantage of that form of store as a protection from excessive ground water.

### PESTS

Virtually all padi farmers volunteered the response that their padi suffered from pests, insects and rats being those most commonly named. The disease known locally as *pényaket merah* attacks the plant from the roots and causes stunted growth and low

yield. Peasants consider this trouble is caused by the stem-borer which they call *ulat kisar* or *ulat merah*. This is denied by the Agricultural Assistant. The disease is said to be most acute in the off-season.

Poison supplied by the Agricultural Department is mixed with boiled rice and used to combat field rats.

### FERTILIZERS

The use of fertilizer is not common, reportedly because it is too expensive. According to the Agricultural Department, bat guano is applied in two ways: indirectly as a solution in which seeds are soaked for forty-eight hours before sowing, or directly to the fields while the plants are growing. The former is used by 30 per cent and the latter by 10 per cent of Dulang farmers.

Chemical fertilizers are also in use on a few isolated lots. They consist of sulphate of ammonia, double superphosphate and rock phosphate. The percentages of padi farmers using the fertilizers were as follows.

TABLE 18: USE OF FERTILIZERS

	GUANO		PHOSPHATE		DOUBLE SUPERPHOSPHATE	
	Percentage of Users	Weight per acre	Percentage of farmers	Weight per acre	Percentage of farmers	Weight per acre
Malays ...	30	21,077 gts.	5	173 gts.	2	274 gts.
Chinese ...	2		6		0	

The problem of transporting fertilizers into the mukim is considerable. An acre of padi is locally thought to need either 140 *gantangs* of guano or alternatively 11 *gantangs* of phosphates, so that a substantial weight is involved and lack of easy transport deters farmers from using them.

### PREVIOUS OCCUPATIONS OF PADI PLANTERS

Of 912 padi planters, only 69 stated that they had moved into this work from other occupations (Table 19), the proportion of Chinese who had thus changed being much higher than that of Malays. The greatest single number of Malays had reverted from rubber tapping, the next highest group being Chinese who had come from mining.

TABLE 19: PREVIOUS OCCUPATIONS OF PADI PLANTERS

	Rubber Tappers	Mine Labourers	Fishermen	Government Employees	Miscellaneous
Malays ...	14	0	5	6	10
Chinese ...	5	11	0	0	18
Totals ...	19	11	5	6	28

The miscellaneous category includes vegetable gardeners, gardeners, labourers, carpenters, shopkeepers, foundry- and mill-hands, motor-vehicle drivers, teachers and a coconut collector.

## CHAPTER IV

### OTHER ACTIVITIES

THE LAND-USE map of Mukim Dulang (Plate 29) indicates how small are the areas in agricultural use other than for padi. There are a few small islands of vegetable land scattered among the padi-fields and associated with Chinese settlement. Coconut palms predominate in the kampong landscape, which also contains a few rubber trees and a little garden stuff, all being included under the heading *kampong land*. Analysis of the working population emphasizes the dominating importance of padi planting among the people of Mukim Dulang (Table 20). It is the occupation of 92 per cent of the total working population, the next largest category being general labourers (two per cent of the working population).

TABLE 20: CLASSIFICATION OF THE WORKING POPULATION

	<i>Padi Planters</i>	<i>Unclassified Labourers</i>	<i>Teachers</i>	<i>Shop- keepers</i>	<i>Fishermen</i>	<i>Others</i>
Malay	...	839	22	5	16	5
Chinese	...	73	1	0	2	0
Totals	...	912	23	5	18	5

Since there is only one padi crop a year, off-season activities are possible for those padi farmers who desire them. Of the 912 padi planters, 254 report taking part in off-season work (Table 21).

TABLE 21: OFF-SEASON ACTIVITIES OF PADI PLANTERS

	<i>Livestock Herding</i>	<i>Vegetable Gardening</i>	<i>Fishing</i>	<i>Odd Jobbing</i>	<i>Rubber Tapping</i>	<i>Atap Making</i>	<i>Labouring for Drainage and Irrigation Depart- ment</i>	<i>Coconut Picking</i>
Malays	...	18	0	118	49	11	20	7
Chinese	...	0	15	0	2	0	0	0
Totals	...	18	15	118	51	11	20	7

### LIVESTOCK

Many fowls and ducks are to be seen in this countryside. There are 11,235 fowls, of which 10,363 are owned by Malays (13 per Malay household) and only 872 by Chinese (12 per Chinese household). Of the 8,626 ducks, 8,034 belong to Malays (10 per Malay household) and 592 to the Chinese (10 per Chinese household). Even among the Chinese farmers no pigs are kept. The Chinese farmers state that the area is too wet for pigs and that in any case rearing them is prohibited.

By comparison with official figures for 1947, the number of buffaloes in the mukim has declined from 450 to 432 and the number of cattle from 87 to 55. The number of goats has increased over the same period from 332 to 764. One hundred and twenty-three other domestic creatures (chiefly geese and pigeons) are found in the mukim.

### FISHING

Although the mukim lies along the coast, only five men (all Malays) are full-time fishermen; 118 others fish only part-time, that is, when work on the padi-fields has ceased. The main fishing periods are (1) between planting and harvesting when field work is light, and (2) between harvesting and the time for the new field preparation.

About 20 fishing boats belong to padi farmers living on the banks of Sungai Sédaka and 14 to those living near Sungai Dulang Kéchil, these two canals being the chief outlets for fishermen in the mukim. Close inshore a seine (*pukat tamban*) is used for netting the fish *tamban* (*Chipea* spp.), which in turn is also used for bait further out in deep water where hook and line (*kail*) are commonly used.

### FRESHWATER FISHING

Freshwater fish collect during the drier season (that is, at harvest time) within ponds artificially constructed by building earth bunds round low-lying places in the fields. The entire catch is sold for as much as M\$100 per pond to dealers who are then responsible for catching the fish. Local freshwater fish are *kéli* (*Clarias majur*), *sepat siam* or *sepat bénua* (*Colera vulgaris*), and *puyu*. During rainy spells, especially when planting is going on, freshwater fish are gathered from the watercourses with hand-thrown nets or suspended bags. Fishing for *puyu* with hook and line in the flooded fields is commonly done by women. It is claimed among the farmers that freshwater fish originate inland near the sources of the Dulang Kéchil and the Sédaka, in a freshwater swamp known as Paya Junun.

### THE RICE TRADE

The team found no one in Dulang who would admit that he was taking part in *padi kunchah*<sup>4</sup>, although several farmers asserted that others in the mukim did it. More people are said to be taking credit from the Rural and Industrial Development Authority, which offers loans at rates (from 10 to 20 per cent per annum) low by comparison with those of private lenders and waived if the loan is repaid within six months.

The only rice-mill in the mukim does not deal in padi. It mills the shareholders' padi, and retails the bran for M\$1.50 per bag (24 *gantangs*). The mill started in April 1953 and Table 22 shows month by month how much it has handled to date and indicates the cycle throughout the year.

TABLE 22: OUTPUT OF DULANG CO-OPERATIVE MILL (IN GANTANGS)

	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1953 ...	—	—	—	200	8000	3840	3680	4000	3840	3040	2720	1760
1954 ...	3680	3680	4320	3360	2240	3680	—	—	—	—	—	—

The mill has a maximum storage capacity of 4,800 *gantangs*, and employs two people permanently, together with some casual workers.

*Rice Dealers*

None of the five rice dealers in the mukim admits to keeping records of business transactions. Dealers buy padi from the farmers and sell it to the rice mills elsewhere in North Kedah. One dealer estimated that in 1953 he had bought 2,500 bags of 80 *gantangs* each. The Tokai Rice Mill, located outside the mukim, buys more than half the padi handled by these dealers and the other half goes to mills at Guar Chēmpedak and Bukit Bēsar.

**ATAP- AND MAT-MAKING**

Ataps are made by those who live near the banks of the lower Dulang Bēsar where *nipah* is most extensive. The atap is sold in Yen Kēchil. Nearly all householders, except the Chinese, make the *mēngkuang* mats needed for drying padi and enclosing threshing tubs. A few baskets, food covers, fish traps and nets are also made locally as a spare time occupation.

## CHAPTER V

### LAND AND LANDOWNERS

IT WAS found impossible to identify the owner of each lot in the mukim for several reasons: the Land Register contains no addresses; some fields have nobody upon them for long periods and those on near-by ones may not be able to help; and owners do not necessarily live within the mukim. Those lots which the team could not associate with people either residing or working in Mukim Dulang are chiefly the most isolated.

The surface of Dulang is divided into 949 lots, averaging 6.1 acres per lot. Slightly over half (432 out of 834) of the lots on which some padi is grown are less than 5 acres in extent, 348 are between 5 and 10 acres and 52 are over 10 acres in extent. Except in the western area the lots are commonly about 5 acres, disposed in long, narrow shapes, and with their narrow ends fronting on watercourses. The eastern three-quarters of the mukim contains some large lots, there being altogether 51 lots each over 10 acres. The largest of these have been, or are now being sub-divided into small units of about seven or eight acres each. So far Lots 530, 926, 927, 928 and 212 have been dealt with in this way. In the western quarter the pattern of lots is far more irregular and characteristically smaller (mostly three acres each). Even where the western lots are long and narrow, they are aligned from east to west at right angles to the coast, in contrast to the north-south alignments, at right angles to the canals and parits, which occur elsewhere in the mukim. Separate lots of kampong land and of padi-land are not common here. There are 50 lots exclusively of kampong land (i.e. 5 per cent of all lots) and 278 lots exclusively in padi (i.e. 29 per cent of the total).

Of the large landowners (those owning more than 10 acres) 42 are Malay (815 acres), 7 Chinese (151 acres) and 3 Indian (166 acres). The greatest single holding appears to be one totalling 113 acres in three parts: this is owned by a Malay who lives within the mukim. Only six individuals possess holdings of padi-land exceeding 40 acres, three of them being Malay (all living within the mukim), two being Indians and one Chinese. One of the Indian holders lives in Sungai Patani; the other, like the Chinese, cannot be traced to an address, though this itself suggests that he lives outside the mukim. Five of the large holdings are in three or less lots, one—that of the Sungai Patani Indian—is in 11 lots. Of the total of 949 lots, apparently only 119 (14.5 per cent totalling 925.56 acres) are owned by persons known to be living outside the mukim, and 19 by persons in adjacent mukim, who cannot accurately be called absentee landlords. Of the 119 living neither in this or the immediately adjacent mukims, 83 are Malay, 21 Chinese and 15 Indian. While to the west of the path to Yen Kechil there are 38 small and isolated lots owned by persons outside, east of it there are 44 large lots so owned, four of them being over 50 acres in extent (Plate 30).

The relation of workers and owners to the fields is complex. There are 274 lots (1,489 acres) reputedly owner-worked and fairly evenly scattered over the whole mukim (Plate 31). Thus 29 per cent of the lots and about the same percentage of the area, are owner-worked by householders resident on some part of their holding.

The situation for lots not owner-worked is difficult to determine with certainty. Discrepancies between entries in the Land Register and replies about ownership of lots were frequent. In some cases the householder said he worked his own land while according to the Land Register it was owned by another person, sometimes of a different race.

This discrepancy may include cases when the title is in the name of a dependent of the householder, for example, his wife or parents. In addition to land owned and worked by Malays, 199 lots (totalling 1,288 acres) are owned by Malays and worked by other Malays who have no apparent connection with the lessor, and 10 lots (322 acres) are owned by Malays and worked by Chinese. The titles of 18 lots (457 acres) are in Chinese names, and of these Malays work 10 and other Chinese work 8. A number of Chinese landlords own large lots which are divided for renting out but which are not sub-divided by the Land Office: these are in the east and south-east of the mukim. The total area of land owned and worked by Chinese is 430.4 acres (5.4 per cent of the total area). Indians own 23 lots (166 acres) in the east and south.

Of the 882 householders consulted, 475 farm lots for which they pay rent to other persons (Plate 31). Of those who hire land in this way, 430 (375 Malays and 55 Chinese) state that their rent is paid in kind and 45 pay in cash, so that the farmer-owner relationship is overwhelmingly on a payment-in-kind basis. The comment is common that a change to payment in cash is taking place, but no direct evidence to this effect is available. All tenants on a cash basis are Malays (the 45 replies included 24 lots covering 105 acres).

Where rent is in kind, it is fixed in advance at terms varying from place to place and ranging from 90 to 170 *gantangs* of padi per acre, based on the owner's estimate of what a good cultivator should be able to get from the field, that is, on his estimate of the productivity. Tenants stated that local Chettiar landlords charged the highest rents and followed the practice of increasing the rent by two *gantangs* a year. Other Indian landlords ask a fixed rent-in-kind per acre.

According to the Land Register, only 14 of the lots have not changed hands since 1924. Another 275 titles have remained unchanged since the period 1925-1934 and a further 227 last changed hands between 1935 and 1944. Since the beginning of 1945, 314 lots have changed hands. The scarcity of changes older than 30 years reflects that regularization which followed the transfer of Kedah to British protection and the completely new survey for titles which took place when the present drains were laid out (Plate 34).

Of the 882 householders, 458 own no land at all, either directly or through members of their households. Thirty-eight own land but do not work it, 61 neither own land nor work on the land, 44 own some land but also work on the land of others. The landless agricultural households comprise 402 Malays and 56 Chinese.

## CHAPTER VI

### SOCIAL ACTIVITIES AND COMMUNICATIONS

WITH THE exception of the coastal parts, the boundaries of Dulang pass through padi-land or the drains associated with it and do not significantly bar movement of people between it and adjacent mukim, though padi-land when wet is a deterrent. Bridges cross the Sédaka and Sélinkoh-Téroi canals and indicate lines of significant movement.

#### COMMUNICATIONS

##### *Paths*

Two paths which cross the mukim on north-south lines provide for movement between areas further south (toward Yen) and those further north where padi-land continues towards Alor Star. Other footpaths follow the main streams and canals to link up individual houses and set a pattern of two parallel lines beside the canals, from which shorter lines branch off irregularly (Plate 35). More paths connect the groups of dispersed settlements. These are more complicated and run upon the bunds round fields, but their pattern is not really permanent because alternative ways round any one field are equal in length as a rule and the choice of any one depends mostly on the day-to-day condition of the soft ground constituting the bunds. The width of such paths varies from one to two feet, and the ground repeatedly crumbles even under the slight traffic of pedestrians and cyclists.

Three paths form major connections with neighbouring mukim. One runs along the left bank of the Sélinkoh-Téroi canal and crosses the eastern boundary of the mukim. It leads southwards to join the road from Guar Chémpedak to Yen at the village of Téroi. With an average width of 4 ft., in that portion between Téroi village and Dulang Kéchil canal its height drops to about 6 in. It has an uneven surface and can be used for cycles only on dry days. The second major path begins at Yen Kéchil on the road from Guar Chémpedak to Yen, passes northwards through the little group of shops at Kampong Dulang Kéchil and ultimately crosses the northern boundary. This path, roughly 2 ft. wide, stands on a bund but is frequently flooded after heavy showers. Unfortunately, the water pipe-line, only partially embedded in the bund, rests on the surface and interferes with cycling. The third path is along the left bank of the Sédaka canal. It begins half a mile inland from the sea and continues eastwards across the mukim boundary until it meets the Mat Saman canal beside the north-south trunk road from Alor Star. Because it has numerous breaches where drains discharge into the Sédaka canal, this path is less suitable for cycling than the other two and is the most liable to flooding. Its western portions are sometimes flooded to a depth of more than three feet.

##### *Sample Traffic Count*

The relative importance and characteristics of movement along the paths linking Dulang to Téroi and Yen Kéchil are indicated in Figs. 9 and 10, which show traffic counts taken on market days. It should be borne in mind that one bicycle usually

carries only one person. The volume of traffic along the Tēroi path was on each occasion greater than that on the other, but of more significance are the cycles shown by the graphs. On the Tēroi path there is a definite movement northwards *out* of the mukim towards Tēroi (where a market is held) early in the morning, with maxima between 7 a.m. and 8 a.m., and a peak returning from Tēroi in the early afternoon (1 p.m. to 2 p.m.). Marketing by adults and the movement of school children are the chief impulses to this traffic. In contrast, on the same days along the Yen Kēchil path the early morning peak (from 7 a.m. to 8 a.m.) of movement is northwards into the mukim, involving on this occasion those women who work at transplanting. The afternoon flow is southwards, indicating the homeward movement of these temporary workers.

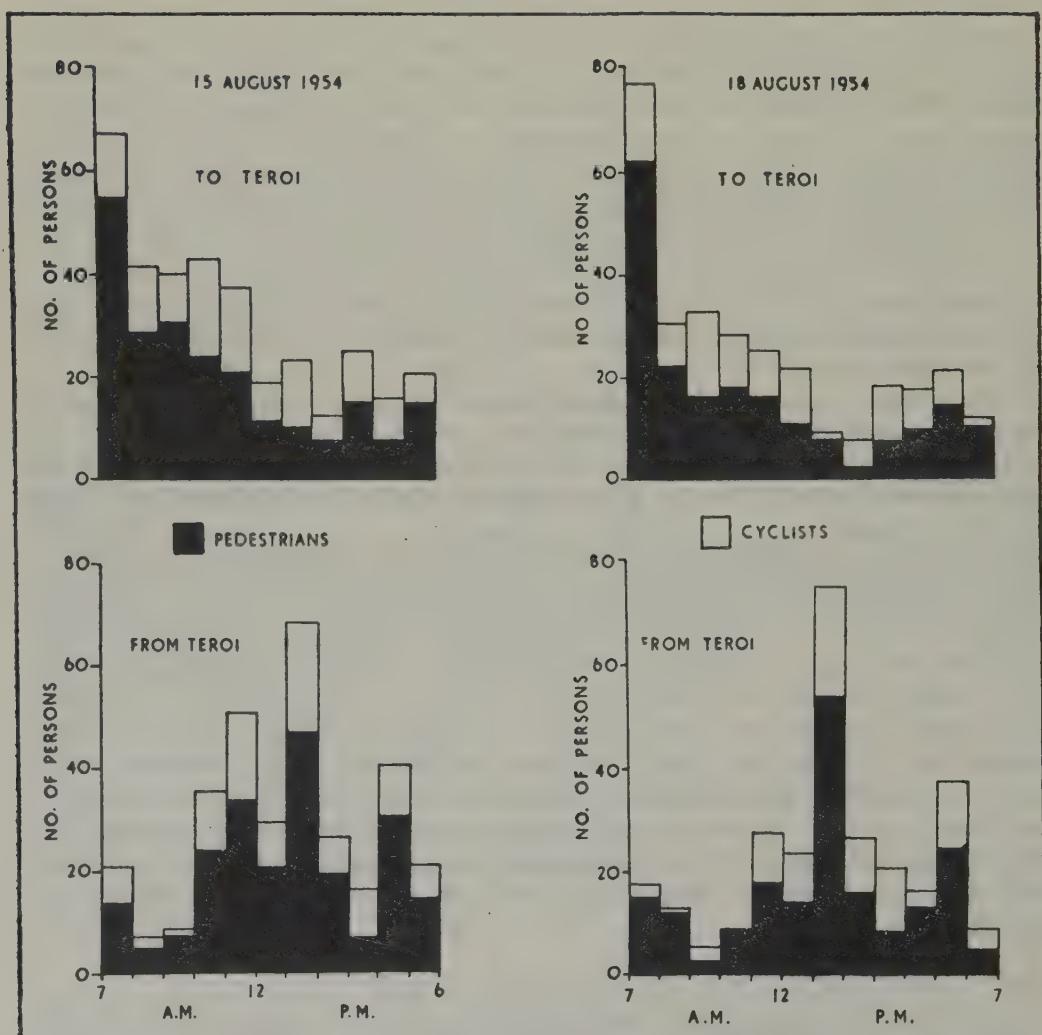


Fig. 9. Traffic on the Tēroi path.

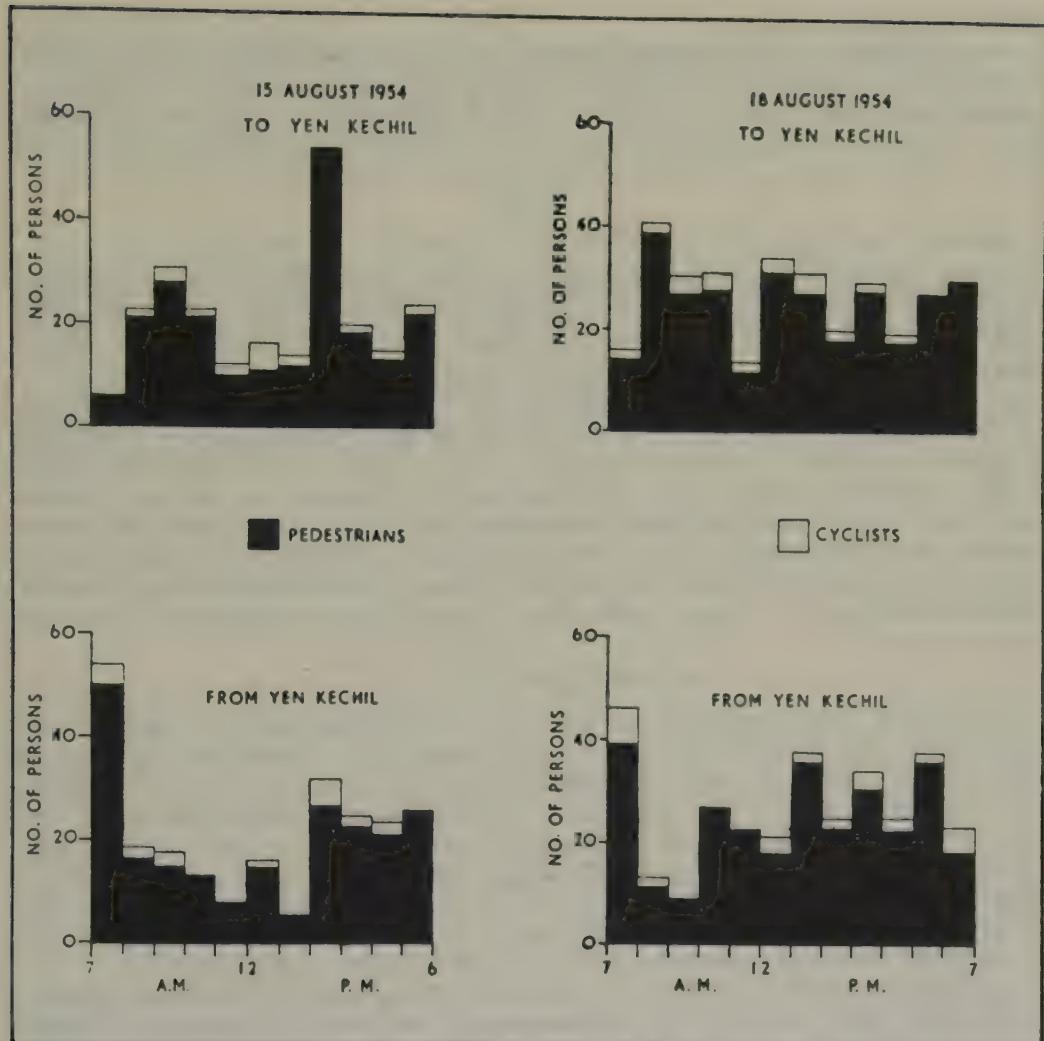


Fig. 10. Traffic on the Yen Kechil path.

#### MOVEMENT OF PADI PLANTERS FROM HOUSE TO FIELD

The pattern of house-land relationship and the difficulty of movement within the mukim are such that only rarely does a planter have far to walk to his padi-field. Plate 38 shows a portion of the mukim in which, out of 84 households, 71 work on the same or adjacent lots and a further 8 less than 500 yards distant.

#### Waterways

The Sédaka, Dulang Kéchil and Téroi-Sélinkoh canals are navigable by boats as far as depth and regular water are concerned, although hindered by sluice gates. The uncanalized Dulang Bésar is now unusable by boats owing to silting at its mouth, but elderly local people say it was formerly used by small boats which could travel from the sea as far inland as the path to Yen Kéchil.

### *Bridges*

Bridges which span the Sēlinkoh, Sēdaka and Dulang Kēchil canals and the Dulang Bēsar River are slight structures made of local materials, such as palm trunks and branches tied together in twos and threes. A few bridges are more solidly built of planks. Where paths cross the small drains flowing into the main canals, coconut or areca-nut trunks are laid down, but these cannot meaningfully be called bridges.

### MOVEMENT OF PADI

After the harvest has been threshed in the field, that proportion of the crop that is sold from the field is drawn out on a buffalo sledge to the nearest canal, where it is loaded on to a boat. Some of this padi moves downstream along the Sēdaka and Dulang Kēchil canals in small boats, which enter the sea and then turn into the Yen River to reach Yen Kēchil. Thence this padi is conveyed to the mills in lorries. Other padi moves upstream along the canals as far as the main trunk road, where it is also transferred to lorries. Other padi is stored temporarily in a local dealer's store, where the process is ultimately the same though delayed in phasing. In all cases bicycles are used at some juncture, more especially at points where sluice-gates obstructing waterways make it necessary to transfer padi from one boat to another. Irrigation and drainage interests thus override those of transport, which makes padi shipment cumbersome, slow and labour-wasting.

### DOMESTIC WATER SUPPLIES

In Dulang unlined wells are the usual source of drinking water, except for those people living near the pipe-line along the Yen Kēchil path who use public stand-pipes (Plate 36). The wells also supply water for washing and bathing, particularly for households located away from any watercourse. Our investigators located 114 wells used only for bathing and washing. Of the potable-water wells, 215 are less than 5 ft. from top to bottom, 342 between 5 and 10 ft. deep, while 21 reach more than 10 ft. below ground-level. The mouths of many wells are banded with earth to a height of a foot or more: none have concrete mouths or linings. The water in this mukim is slightly acid in the inland areas and alkaline nearer the sea. (See Chapter I of this part).

During droughts many wells dry up completely for as long as two or three months, during which time water is fetched from stand-pipes and from the upper part of Sungai Tēroi (Plate 37). Boats are used to bring such water to the west of the mukim.

### HEALTH

In Dulang there is no focus of health interests, the nearest dispensary being at Yen, 4½ miles beyond the southern boundary. A hospital assistant visits the mukim once monthly and states that most patients treated have skin diseases. Bronchitis is a frequent problem. Because of the difficulty of access, only a small fraction of the population is reached by the health services. No sanitary organization exists and neither buckets nor pits are in use anywhere in the mukim.

### SCHOOLS

A Malay school at Dulang Kēchil is one of the few brick-and-tile buildings in the area and the focus of movement for 300 children (255 boys and 45 girls). The only other Malay school is a kindergarten. Schools in adjacent mukim are used by some

Dulang children. For example, 63 boys and 15 girls from eastern Dulang attend the Malay school at Téroi, 7 boys and 3 girls from the mukim attend the Malay school at Ulu Sédaka in Sungai Daun, the mukim to the north, while the Chinese school at Yen Kéchil receives 7 Chinese boys, 3 Chinese girls and 1 Malay boy from Dulang. The Malay boys' school in Yen has 3 pupils from Dulang.

#### SHOPS

Of 17 shops within the mukim, 6 are provision shops (4 Malay and 2 Chinese), 8 are padi- and copra-dealers (1 Malay and 7 Hokkien) and 3 provision-cum-coffee shops (all Malay). Six of the village shops are grouped at Kampong Dulang Kéchil, but the main focus for shopping by Dulang people is Yen Kéchil, outside the mukim itself.

Weekly markets are held outside the mukim at Guar Chémpedak and Téroi on Wednesdays and Sundays respectively, and another in Mukim Sungai Daun to the north. Dulang people go marketing at all three.



PART FOUR  
BAGAN SERAI TRIANGLE, KRIAN



## CHAPTER I

### THE PHYSICAL ENVIRONMENT

THE KRIAN DISTRICT of North Perak is part of a low plain stretching for twenty miles inland from the coast until it meets the foothills of the Bintang Range. To the north the plain extends into Province Wellesley while to the south of it lie the mangrove belts of Matang. The area investigated in Krian North is triangular in shape and delimited by three roads, Sungai Siakap, Kuala Kurau and Bagan Sērai main roads, which link the three settlements of Simpang Lima, Kuala Kurau and Bagan Sērai at its corners (Plate 39). It covers 14.85 sq. miles (9,504 acres), does not coincide with any administrative unit and includes parts of three mukim. The road which forms the eastern side of the triangle is part of Malaya's north-south road system and carries traffic between Butterworth and Kedah (to the north) and Ipoh (to the south).

In this otherwise flat and low terrain,<sup>1</sup> artificial bunds, embankments, canals, distributaries and parits provide the low relief and dominate the landscape forms. Yet towards Bagan Sērai, where the land is a foot or so higher than the adjacent areas, insufficient water is frequently reported as the main cause of low yields and of neglect of padi-fields. At Parit Maaris in the northern corner, on the other hand, excess water has caused padi-land to be abandoned (Plate 40). Bunds lines the network of parits and provide the chief lines of movement within the triangle. Along the Main Canal, to raise the bunds sufficiently, additional earth was dug from the land adjoining the canal, creating *borrow pits* which complicate the drainage (Fig. 11) and act as sumps for most of the year. The drainage of the area is more artificial than natural. A number of drains were dug there prior to the era of British Administration,<sup>2</sup> that is, before about 1880. Natural streams have been canalized and incorporated in the artificial drainage system. The parits are usually straight, parallel water-lines, in contrast to the curved course of the Main Canal. The level of the padi-fields in the triangle averages four feet above mean sea level, but twice monthly spring tides exceed that height, so that bunds and embankments are necessary along the coast (five miles to the west of the triangle) and beside the rivers in order to protect the area from floods when the tides dam water in the channels.

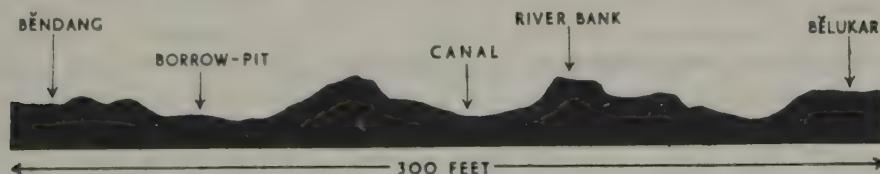


Fig. 11. Bagan Sērai triangle: section across the main canal, at a point northwest of Bagan Sērai, showing *borrow-pits*. The vertical scale is approximately twice the horizontal.

The average monthly temperature is 82° F., the diurnal range being from 71–93° F. Rainfall is high, averaging 97.4 in. per annum and occurring throughout the year, though a seasonal fluctuation, which has greater human significance than any other

1. The Main Canal falls at the rate of only 6*½* in. a mile from Bagan Sērai in the south to Jalan Bahru in the north.

2. *Annual Report of the Drainage and Irrigation Department* (Kuala Lumpur, 1946).

climatic fact, can be discerned. Fig. 12 indicates that the wettest periods of the year are during March and April and from September to November.



Fig. 12. Average annual rainfall at Parit Buntar (1921-39).

The only available survey of local soils was taken at a point outside the triangle at Kampong Padai (Table 23) in Bagan Sërai. Out of ten boreholes to a depth of eighteen inches, 3 showed a loss on ignition of more than 35 per cent and are classified as *muck soils* i.e., they are largely of vegetable remains. These are widespread in the triangle, often overlying sandy layers and posing special problems for wet agriculturists.

TABLE 23: SOIL SAMPLE FROM KAMPONG PADAI, BAGAN SERAI, 26TH JANUARY, 1954

Borehole	Depth of	Clay Percentage	Silt Percentage	Fine Sand Percentage	Percentage loss on ignition	Ph Value
1.	Top Soil	0—9"	.....	Muck .....	36	4.8
	Sub-Soil	9—18"	25	41	34	5.09
5.	Top Soil	0—9"	14	45	41	5.03
	Sub-Soil	9—18"	16	47	37	5.35
9.	Top Soil	0—9"	.....	Muck .....	40	5.02
	Sub-Soil	9—18"	29	39	32	5.42
10.	Top Soil	0—9"	.....	Muck .....	55	4.85
	Sub-Soil	9—18"	.....	Muck .....	55	5.35

The area has been under cultivation to about the same extent as now for some fifty years and little natural vegetation remains, though elderly peasants claim they remember significant stands of *nibong* (*Oncosperma tigillaria*) and *nipah* (*Nipa fruticans*). *Mëndërong* (*Scirpus grossus*) and water-hyacinths (*Eichhornia crassipes*), quick growing, water-loving plants, are common in the watercourses, where they frequently impede drainage.

## CHAPTER II

### POPULATION AND SETTLEMENT

THE POPULATION of the triangle was found to be 7,700, giving an average density of 518.5 per sq. mile. But as Plate 41 indicates, there are large areas without houses, for settlements in the triangle are concentrated into linear patterns. Houses are strung along the peripheral main roads and along the irrigation parits in the interior of the triangle. There is a contrast, however, between the detail of the linear settlements along the main roads and those along the interior parits. In the former, houses are often in elongated clusters, broadening occasionally into small nucleations, whereas it is more common to find a single row of houses along each side of a parit.

Land is divided into long narrow lots fronting on a road or parit (Plate 41). In some instances a strip less than a hundred feet wide may stretch for as much as half a mile back from a parit or road. The location of kampong land in each holding is established by regulation: "A strip . . . chains wide adjoining the . . . road/ditch may be brought under kampong cultivation provided that a substantial *batas* be erected along the inner limit of this strip and the remainder of the land used exclusively for the cultivation of wet rice. Nothing whatever shall be planted on the inner *batas*." The linear pattern is thus determined to some extent by the pattern of land holdings, but there is at least one good example in the triangle of settlements following a parit irrespective of the position, shape or alignment of the land lots (Plate 42).

Two features of the linear settlements along the interior canals and parits stand out. First, the parit settlements are grouped along alternate parits so that only one end of each padi-lot is used for kampong. Second, there is little settlement along the Main Canal, because it is forbidden to build houses and plant trees along the canal bunds, both of which are flanked by the wet, marshy sumps of the *borrow pits*.

#### RACIAL COMPOSITION

The population of 7,700 is contained in 1,578 houses, of which 1,290 are Malay, 158 Indian and 130 Chinese. The adult sex-ratio is 2,283 males to 2,404 females; there are 3,013 children under twelve.

##### *Malaysians*<sup>1</sup>

This group includes many Banjarese, who total 57.2 per cent of the Malaysian households. Plate 43 shows the tendency of Banjarese to live in clan-clusters rather than spread evenly among those Malays born in Malaya. True Malays predominate along the main roads, Banjarese in the interior along the parits; along Parit Mahamat (the westernmost parit) all 69 households are Banjarese. Those Banjarese along the main roads also show this clustering characteristic. Only 30 Banjarese are in groups of less than three.

##### *Indians*

As in many other parts of Krian, Indians are more numerous than Chinese. All but one (a Pakistani) are Tamil and they concentrate in the south of the triangle, near

1. In this mukim there are both Malays (born in Malaya) and Malaysians (similar stock born in places outside Malaya).

Bagan Sērai. They also live along the Bagan Sērai Road from Simpang Lima southwards for about three miles, while a few Indian households are found along the road from Kuala Kurau to Simpang Lima, east of Jalan Bahru.

### *Chinese*

The Chinese concentrate along Jalan Bahru in the north (30 households) and elsewhere along the northern road between Simpang Lima and Kuala Kurau, where there are altogether 61 Chinese households. The Chinese households total 130 and are mostly Hokkien (90), though there are 24 Tiechiu and 16 Cantonese households. Of the Hokkien, 63 per cent are along the northern side of the triangle, the rest being mostly either at the Bagan Sērai corner or along the Bagan Sērai main road. Plate 44 shows the distribution of the Chinese clans and of the Indians.

### GROWTH OF SETTLEMENT

The area has assumed its present pattern of settlement since the opening of the Krian Irrigation Scheme in 1906. There is little evidence today of conditions prior to the introduction of irrigation. Indians came to Krian during the latter half of the last century as labourers in the newly established plantations of rubber in and near this area. By now, they have gravitated towards the outskirts of villages, as at Bagan Sērai and Simpang Lima, and work in the town as P.W.D. labourers and lorry drivers. A few households are still growing padi.

The investigators discovered that 718 householders (46 per cent of all those in the triangle) had been in the area for less than ten years. Of this comparatively recent group, 612 households are Malay, 57 Indian and 49 Chinese. The balance of 837 householders has been in the area for more than ten years. These figures give an indication of the degree of fluidity and the relative newness of the population.

The origin of immigrants in the above sense (i.e. less than ten years in the area) was examined for 535 households who were willing to speak of the matter. They consisted of 429 Malay, 57 Indian and 49 Chinese households. Of immigrant Malays, more than one-third (162 households) had come from elsewhere in North Perak and another 56 (mostly Banjarese) from Borneo. Of the 57 recently arrived Indian householders, 31 came directly from India, while 37 out of the 49 Chinese households said that they had come direct from China.

### HOUSE TYPES

#### *Malay*

The native Malay house in the triangle is invariably raised on stilts 3-10 ft. above ground-level) with plank walls and atap roof. Occasionally the walls are of plaited bamboo. In a few instances the piles are simply the trunks of trees.

Banjarese houses show variations from the Malay (Fig. 13). They have longer stilts than the average Malay house and slits in the walls for windows. These slits, often the width of one of the wall planks and some three to four feet long, are closed by flaps of wood hinged at the top or bottom. Two or more slits may be in one wall and at such a height that a person sitting on the floor inside can look through them. The Banjarese claim that these slits are easier and cheaper to construct than windows. Another feature of Banjarese houses is an open platform or verandah. Those Malays who have a verandah surround it with a waist-high wall.

*Indian*

Indian houses are on platforms of beaten earth raised from six to eighteen inches above the ground. They are chiefly of atap and wood, but some have both walls and roof of corrugated iron. One characteristic is the front porch or five-foot way sheltered by a forward extension of the roof. It is also usual to find several Indian houses under a common roof (Fig. 13), whereas Malay and Chinese houses are always detached.

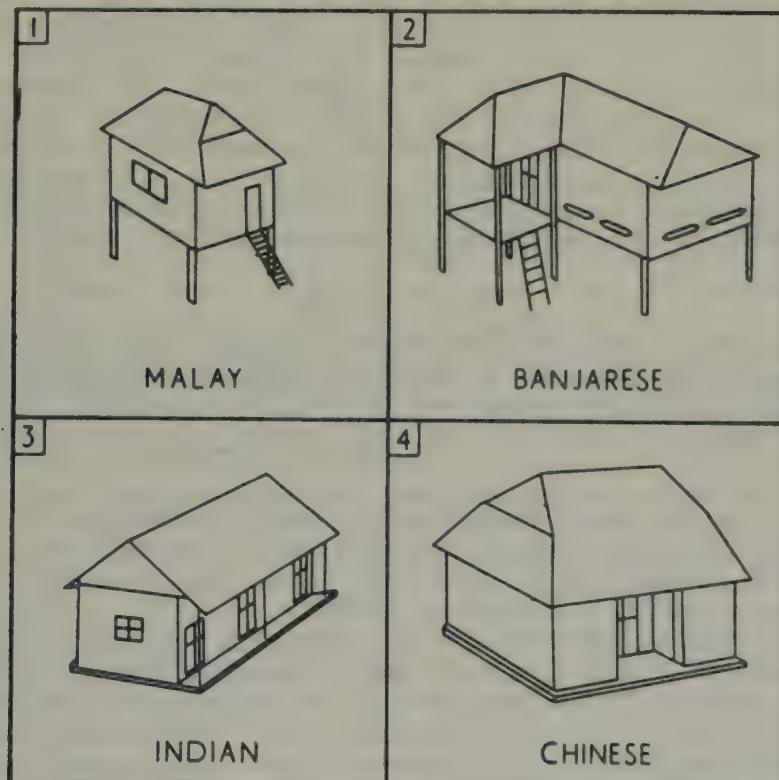


Fig. 13. House styles in Bagan S̄rai triangle.

*Chinese*

Chinese houses are of the same materials as Malay and Indian houses, and, like Indian houses, rest on earthern platforms. They often have built-in porches (Fig. 13).

## CHAPTER III

### PADI

PADI-LAND OCCUPIES 89.5 per cent of the total of the triangle (8,249 acres out of 9,213 acres) and is arranged as broad belts between narrow strips of kampong. There is only one crop of padi per annum. Poor soil, inadequate water supply and the use of long-term varieties of local padi,<sup>1</sup> are factors advanced by the peasants to explain the absence of double-cropping, but the local officer of the Drainage and Irrigation Department considers that the shortage of labour to tend the irrigation system is the chief deterrent. It would be impossible for the limited staff available to maintain the water facilities without the off-season period associated with single-cropping. Between March and May the fields are left fallow, when they are covered with a swamp vegetation, the most common plant of which is a shrub locally known as *sēmantah* (*Vitex clarkeana*).

### FIELD PROCESSES

Only the *tajak* is used in the initial process of slashing the reeds, rushes and grasses (including *sēmantah*) while they are standing in water. The ideal condition for using it is when water in the field is almost one foot deep. The slashed reeds and rushes are raked into heaps and left to rot in the wet fields for a week or so, before being scattered to provide manure for the plants, any surplus being pulled to the sides to build up the bunds. The field is then considered ready for transplanting. In this area there is no ploughing by buffalo, whose weight is locally claimed to be too great for the deep, soft soil. The farmers also assert that the buffalo would destroy the bunds and embankments, damage the canals and pollute the water. The local Agricultural Officer, however, considers these factors to be of secondary importance.

Before establishing nurseries in June, an operation called *presaturation* is practised.<sup>2</sup> May and June are normally dry months, and it is impossible, starting with a dry field in June, to ensure the 3 in. of water necessary for the plants in the nurseries. Outlet water-gates are closed on or about 25th April to retain the last of the rainfall of that relatively wet month (Fig. 12). The water thus collected can be supplied to the fields when it is needed.

During June the seeds are first soaked in water and germination hastened by placing a bag containing the seeds in a drain near the house for two or three days. A primary seed-bed (averaging 3 ft.  $\times$  10 ft.) is constructed by heaping up dried reeds and grass to form a raised platform slightly below water level; the seeds are then sown on a thin layer of mud taken from the bottom of a drain and spread over the surface of the bed. For protection against birds and other pests the farmer covers the sown seed-beds with dried grass or banana leaves. After from ten to fourteen days the seedlings are 8–10 in. high and ready for *shifting* from the primary seed-bed into the secondary seed-bed. The initial sowing process is called *mēnabor*, while the shifting process is known as *mērēdeh*. *Mērēdeh* always precedes transplanting to the final padi-field in the triangle. In June the water in the fields is about 3 in. deep; if planted, the young padi will be sufficiently grown by September to tolerate the floods which are likely at that time.<sup>3</sup>

1. The padi planted in the area is chiefly the long-term varieties known locally as *Machang*, *Siramp* or *Mayang*.  
2. *Sa Batil*. All take over seven months to mature but have strong roots which hold firmly to the soft ground.

2. See *Standing Orders for the Operation of Krian Irrigation Works*, paragraph 9.

3. *Ibid.*

Transplanting from the secondary seed-bed to the padi-field begins in August and for this operation the *kuku kambing* is widely used. Two or three padi-plants are placed between the prongs of a fork and then pressed into the soft ground to a depth of two or three inches. The process does not usually take place until the seedlings have attained a height of about 28 in., that is, after from forty to sixty days. In planning his transplanting, the farmer follows one of two methods, depending on the amount of labour available. If he has a small family and cannot hire extra workers he will cultivate his land in successive phases. A farmer helped by his wife and one or two children takes at least fifteen days to prepare about four acres of land for transplanting. Since the grass grows very quickly, he must prepare and transplant his land plot by plot. It is necessary for a farmer using this method to cultivate several varieties of padi having different periods of maturity, so that all will ripen together even though planted at different times.

The second method is to transplant wholly at one time. This requires more workers, but is preferred by the farmer as he can then complete the cultivation of his land within the period stipulated in local regulations. It also allows him to cultivate one strain of padi and to expect that all grain will ripen at the same time, thus reducing the danger from pests. On the other hand, the farmer may find it advantageous to cultivate different strains in such a way that during the harvesting period, with a small number of workers, he can harvest the padi plot by plot as the grain ripens.

The processes involved in padi cultivation must each be done according to a local regulation which lays down dates that have become constant (Table 24).

TABLE 24: OFFICIAL DATES FOR THE CULTIVATION OF PADI IN THE MUKIM OF PARIT BUNTAR, KUALA KURAU AND BAGAN SERAI

	1951-2	1952-3	1953-4	1954-5
The construction or putting in order jointly by all proprietors or occupiers of padi-land, of dams, water-wheels, and water-courses, and individually by each proprietor or occupier of all division ridges between padi-fields.	20/4-15/5	30/4-25/5	30/4-25/5	30/4-25/5
Establishment of padi nurseries. "There is a strong belief in Krian that nurseries should be planted during the <i>bulan-gēlap</i> , i.e. during the week before and the week after the new moon. The latitude allowed in the dates given (every year) is sufficient to cover the difference in the phase of the moon in different years."	10/6-5/7	8/6-3/7	8/6-3/7	8/6-3/7
Clearing the padi-fields.	10/6-15/8	8/6-13/8	8/6-13/8	8/6-13/8
Transplanting.	10/8-10/9	8/8-8/9	8/8-8/9	8/8-8/9
Weeding.	10/9-10/10	8/9-8/10	8/9-8/10	8/9-8/10

Harvesting usually begins in February and one of two methods may be used: (1) The grain may fail to ripen simultaneously. To harvest the padi the farmer then uses the *kētam*, which enables him to pick out the ripe heads from those still green. Harvesting with this implement is a slow process as the padi has to be cut ear by ear, leaving a stalk length of about one or one and a half feet. (2) When the grain ripens uniformly, the *kētam* is replaced by the sickle, which leaves much longer stalks.

Grain cut with the *kētam* requires a different method of threshing from that cut with the sickle. The former is separated from the stalks by first hammering with a stick and then by treading on the grain. A hard, dry piece of ground is necessary for the purpose and the padi is brought home and placed on *mēngkuang* mats spread underneath or outside the house. Padi cut with the sickle, on the other hand, is usually threshed in a box in the field where it is gathered.

For winnowing, the farmer is dependent chiefly on weather conditions. The best time for winnowing during the day is said to be between 2 p.m. and 4 p.m., and the most reliable wind in the area is said to be that blowing from the west or south-west—that is, a sea-breeze. In an attempt to achieve some degree of independence of weather conditions some farmers are using a crude, hand-driven, wooden fan to provide an artificial wind for winnowing.

The farmers store their padi in sacks, boxes or *jēlapang*. The sacks each hold about 25 *gantangs* and can be kept in the house. When the quantity of padi is large it is stored either in wooden boxes or in *jēlapang*. The distribution of padi stores (Fig. 58) correlates with the distribution of houses, for each *jēlapang* is close to its owner's house; there are noticeably fewer stores near houses close to the road and more among houses along parts in the interior of the triangle. According to data collected, the total storage capacity of all *jēlapang* is 784,260 *gantangs*, averaging 660 *gantangs* per *jēlapang*. In addition to this, there is the undetermined capacity of wooden boxes and sacks. *Jēlapang* on the fringe of the triangle may include produce from outside, and padi from bordering fields may be stored outside the triangle.

### YIELDS

Plate 46 shows that the areas of highest yields (over 200 *gantangs* per acre) are in the north-west of the triangle: (1) beside the Simpang Lima—Kuala Kurau road; (2) stretching into the triangle on both sides of the Main Canal to a depth of 2,000 yards from the Simpang Lima—Kuala Kurau road; and (3) a strip some 1,500 yards wide running across the triangle from the Bagan Sērai—Kuala Kurau road towards the Simpang Lima—Kuala Kurau road. Areas of low yield (less than 100 *gantangs* per acre) are scattered throughout the triangle, but are particularly numerous along the Bagan Sērai main road.

The reported yields were low, the average per acre of padi being estimated as 84 *gantangs* and some lots apparently producing negligible yields. These figures express the marginal character of much of the padi-land in the triangle. According to the farmers, the main reasons for the low yields are pests (reported by 892 farmers), shortage of water and pests (57 farmers), and excess of water and pests (13 farmers). Production was estimated at 699,696 *gantangs*<sup>1</sup> for those lots for which data could be obtained.

The pattern of yields (Plate 46) correlates closely with the pattern of the official classification into first-, second- and third-class land (Plate 47). The first-class land is almost all in the mukim of Kuala Kurau, in a strip about one-third of a mile wide along the road from Simpang Lima to Kuala Kurau. Immediately adjacent but in the same mukim is some second-class land, while the rest of the triangle is described as third-class land. The areas of highest yield on Plate 46 are roughly in the same areas as the first-class padi-land and parts of the second-class land shown in Plate 47. But here the

1. This figure is calculated by adding the production figures for each padi-lot, based on the padi acreage and stated yield for each lot. Two factors must be taken into account here. First, the yield stated was subjective, and second, no data could be obtained for seven per cent of the lots.

correlation breaks down: the similarity in yield *patterns* is not accompanied by a similarity in the quantitative estimates of yields. The official classification is based on yields over 450 *gantangs* per acre (for first-class padi-land), 300–450 *gantangs* per acre (for second-class land) and less than 300 *gantangs* per acre (for third-class land). This classification is clearly based on a much larger geographical area than the triangle. To the west and north-west are parts of Krian with first-class land producing higher yields of padi than are reported in the triangle. The official classification seems unrelated to present conditions in the triangle. It is noteworthy, too, that the estimated production of the triangle (699,696 *gantangs*) is less than the estimated *jelapang* capacity (784,260 *gantangs*).

### LABOUR

Heavy field work such as slashing the reeds is normally the work of the man: women heap the slashed grasses and do the transplanting. Harvesting, however, is done by both men and women. A farmer obtains his labour force from three sources: his family, his friends and from hired workers. When a farmer invites friends to help him cultivate his fields, he is obliged by custom to provide morning and mid-day meals; this method of working the fields is known as *bērdērau*. Of 292 farmers reporting that they used workers from outside their immediate family, 108 said that they used this system, employing a total of 893 friends, all of which—both farmers and labourers—were Malay. The hired workers, as distinct from friends, were normally paid in cash; 177 farmers (including 47 Indian and 8 Chinese) reported hiring workers (totalling 2,857) for cash. For transplanting, each worker was paid between M\$1.50 and \$2 for a morning of four hours. For slashing, the workers were paid M\$18–21 per acre or M\$2 per person for a morning. The estimate of man-days of extra labour employed at the peak season was as follows: slashing, 3.2 men for an acre; transplanting, 5 women for an acre. Hiring for a share of the crop was not common. Only 7 farmers (5 Malay and 2 Indians) reported it and stated that it involved 72 persons.

### FERTILIZERS

The application of manure and chemical fertilizer in padi-fields is not widely practised in the triangle. The reasons given for this were as follows: (1) the high cost of fertilizer; (2) the poor quality of bat guano bought locally. The farmers suspect that it is mixed with earth or other materials; (3) transport difficulties; (4) fertilizer or guano cannot be applied to the land efficiently or economically because the water in the plot does not remain static for long enough.

### PREVIOUS OCCUPATIONS OF PADI PLANTERS

Of the 102 padi-planting householders (8 per cent of the total) who said they had changed to planting from some other activity, 77 were Malays, 18 Indian and 7 Chinese. The previous work of 58 out of the 102 householders was rubber tapping. Four planters previously worked in Government offices (Table 25).

TABLE 25: PREVIOUS OCCUPATIONS OF PADI PLANTERS

Type of Work		Malays	Indians	Chinese	Total
Rubber tapping	...	56	0	2	58
Coconut growing	...	4	0	2	6
Government	...	3	1	0	4
Other employment	...	14	17	3	34
Total	...	77	18	7	102

### IRRIGATION

The Krian Irrigation plant is the oldest in Malaya. Completed in 1906, it serves an area of 71,160 acres and takes its water from the Bukit Merah Reservoir in the east (Plate 39). From Bukit Merah the Main Canal carries water to Krian and cuts across the area of this survey on its way to the coast, entering the triangle at Bagan Sērai and leaving it at Jalan Bahru. During its course across the triangle, the canal feeds nine major distributaries on its south side and seven on its north side.

The drains and distributaries are cleared of *lalang* once every six months and repaired whenever necessary during the off-season. During the slashing season, the farmer may pile his weeds on and along the bunds of a distributary and so help to strengthen and maintain it. These bunds have become paths, setting the pattern of movement within the triangle, making for the use of foot or bicycle transport exclusively and suffering some damage in consequence. The bunds are often weak, and in the year 1953-4 those bounding the Main Canal alone gave way in nine places.

## CHAPTER IV

### OTHER ACTIVITIES

THE AGRICULTURAL land-use map (Plate 48) emphasizes the domination of padi in the landscape. The main triangle of padi-land is bordered by a strip of kampong land averaging 100 yards in width, with strips of kampong running in parallel lines at right-angles to the Bagan Sérai-Kuala Kurau road. Few other agricultural activities appear on the map. Coconuts cover 217 acres, rubber 51 acres and vegetables 4 acres (Table 26), but all coconuts, rubber and vegetables are found on kampong land and are identified with house sites as much as with agricultural use.

TABLE 26: LAND USE

		Acres
Padi	...	8,249
Orchard and garden stuffs	...	513
Coconuts	...	217
Rubber	...	53
Vegetables	...	5
Uncultivated	...	169
Open space	...	7
		<hr/>
		9,213

Rubber small-holdings are in most cases worked only after the harvest. Some trees have not been tapped for the last two years, allegedly because of the low price. Agricultural land in the triangle on which padi is not grown is commonly associated with slightly higher country where surface water is characteristically absent.

#### FISHING

Fishing from canals and fish-ponds amid the padi-fields is a common part-time occupation of planters. The principal method they use is the trap, though rods and hand-nets are numerous. Fishing becomes a common activity after transplanting but its peak season is after the water has been drained from the padi-fields. The common fish caught are known as *sépat siam*, *bembat* (or *kili*) and *arwan*.

#### LIVESTOCK

The questionnaires recorded 14,252 fowls, 3,650 ducks and 182 goats in the triangle. Plate 49 shows the distribution of lots reporting more than 20 fowls and indicates a correlation with the areas of highest yields in the triangle. To feed the birds the farmer needs a surplus of padi over his consumption, a rare occurrence outside the areas of highest yields. Moreover, to keep fowls and other livestock here it is necessary to have a fenced area to prevent damage to the crops in adjacent unfenced land. It was frequently reported, however, that the cost of such wire fencing was higher than most farmers could afford.

Ducks are kept away from the seed-beds but after the transplanting they help to destroy a pest called *kutu bruang* (*Scotiophora*) which attacks growing seedlings. Though the Chinese farmers keep such few pigs as there are (50 altogether), they

possess fewer fowls or ducks (783 and 556 respectively) than the Malays (Table 27). Malay households own on the average 10 fowls and 2 ducks each, while the Chinese average 6 fowls and 4 ducks.

TABLE 27: LIVESTOCK

		<i>Malays</i>	<i>Chinese</i>	<i>Indians</i>
Fowls	...	13,158	783	311
Ducks	...	3,043	556	51
Goats	...	128	—	54

A few cattle (16) and turkeys (3) are kept by Indians.

#### UNCULTIVATED LAND

Of land scheduled for padi cultivation, 2.1 per cent was uncultivated in 1954. An uncultivated lot displeases planters in adjacent lots because it becomes overgrown and helps shelter or breed a number of pests. Under the Land Code, padi-land may not be left uncultivated for more than a year and at least three-quarters of its area must be cultivated with padi the following year, or it is forfeited to the State. According to the Assistant District Officer, land is in practice rarely resumed by the State, but in the Land Register several titles were described as cancelled for non-payment of rent. No example was found of a title being cancelled for failure to cultivate. On the other hand, fines were frequently reported. Reasons given by the planters or owners for failing to cultivate are either inadequate water or excessive water. The largest area of waste land is in the north near the Simpang Lima corner and is locally described as being too wet for any agricultural activity.

#### MILLING OF PADI

Those farmers who are isolated by distance, transport or money difficulties pound their padi at home and go to the mill for processing only when there is a need for more rice than they normally consume, that is, at feasts or for storing during the fasting month. Home pounding is effected by means of a *lēsong*, usually made by the farmer himself. This method of separating the husk from the grain is very slow and is suitable only for use by a farmer with a small family which requires rice for everyday use. The two rice-mills at Jalan Bahru<sup>1</sup> cater chiefly for near-by farmers. One is privately owned (Chinese), the other is a Malay co-operative mill whose function, like the Malay co-operative mill along the Main Road in the south-west of the triangle, is to mill at a charge of 25 cents per picul. The mill retains the bran and sells it for feeding fowls at M\$2.20 per picul. This co-operative has scarcely any storage capacity, its transactions being "in and out". Farmers at some distance from the mill purchase bran through dealers.

The privately owned mill (Chinese) buys padi outright from farmers and middlemen at about M\$17 per picul. It has a storage capacity of over 15,000 piculs. The milled rice is transported to Taiping, Bagan Sērai, Parit Buntar, Nibong Tēbal and Kuala Kurau. More than half its milled rice is sent to Taiping. It has its own motor lorries and middlemen to collect padi from farmers who are unable to bring it themselves to the mill. The difference in amount milled by the Chinese and Malay Co-operative mills at Jalan Bahru (indicated in Table 28) is partly explicable in terms of difference in function.

1. There is another Chinese rice mill at Jalan Bahru which, although it is just outside the triangle, handles an undetermined amount of padi from within the area.

TABLE 28: AMOUNT OF PADI MILLED WITHIN THE TRIANGLE DURING 1953 (IN PIKULS)

		Malay Co-operative Rice-Mill, Jalan Bahru	Chinese Kung Tong Hai Rice-Mill, Jalan Bahru
January	...	328.4	
February	...	700.6	Unavailabe
March	...	638.5	
April	...	347.9	
May	...	546.9	
June	...	296.9	
July	...	330.5	
August	...	229.3	
September	...	159.7	
October	...	90.3	
November	...	76.1	
December	...	85.2	

To cover the cost of transport and profit, middlemen pay less than M\$17 for padi. Farmers are paid by the middlemen between M\$40 and M\$50 for 100 *gantangs* of padi while the price at the mill is about M\$68. The private mill advances money to farmers well known on the understanding that they sell their padi to no other mill. The advance may amount to as much as M\$2,000 per person in a season.

#### Other Mills and Dealers

Plate 50 shows that the main concentration of agricultural mills and produce dealers is at Jalan Bahru where there are four copra dealers, two rice-mills and one timber dealer out of a total of thirteen such establishments in the triangle. Of the other five, one rice-mill is situated on the main road in the south-west, and one timber dealer and one coffee-mill on the main roads near the southern corner of the triangle, where there are also two copra dealers.

#### DOMESTIC INDUSTRIES

Mat- and atap-making are the local domestic industries. Weaving strips of dried *mengkuang* into mats is done by women. An average of four mats a month is made for sale by those householders engaging in this activity, each mat fetching about M\$1.50 at the weekly fair. Atap-making is also a job for women. *Rumbia* and *nipah* leaves are used for the thatch and areca-nut strips for the ribs.

#### MARKETS AND SHOPS

Markets in the area are held daily and weekly. There are daily markets at Kampong Jalan Bahru where fish, meat and vegetables are sold. Weekly markets are held every Monday at the 2½ milestone, Siakup Road, every Tuesday at Simpang Tiga and every Wednesday at Jalan Bahru. They are known as Pekan Senayan, Pekan Selasa and Pekan Rabu respectively. These local markets are mostly private ventures, located along the Sungai Siakup and Jalan Bahru roads, and are held beneath atap roofing supported on bamboo pillars. At the Pekan Senayan and Pekan Selasa markets the owners collect rents but at the Pekan Rabu market the charge is used to meet the expenses of the local mosque. These weekly markets usually last for five hours, from 7 a.m. to 12 noon.

Cloth vendors from Kuala Kurau, most of them Indians, are prominent in these markets. Local products on sale include rakes, *kuku kambing*, *tērendak*, fish traps, baskets of split bamboo, mats, *tajak* handles, local fruit (*chēmpēdak*,<sup>1</sup> *langsat*,<sup>2</sup> *rambutan*<sup>3</sup>), and betel leaves.

Of the 41 shops in the triangle, 32 (71 per cent) are Chinese, 9 (20 per cent) are Indian and 4 (9 per cent) are Malay.

### MOSQUES AND SCHOOLS

Mosques are found along the metalled roads and the main irrigation canal. For purposes of Friday prayers and *zakat* collections the area has been divided into districts, in each of which there is a mosque (Plate 51). The main movement of people to these mosques takes place on Fridays but there is also a daily movement for prayers between the hours of 6 a.m. and 9 a.m. Each mosque can accommodate up to 300 persons and is solidly built on a concrete platform.

All the schools are located along the main roads, which means that houses in the middle of the triangle are at least 2½ miles from a school by way of interior paths. There are three Malay schools within the triangle and three others immediately adjoining it (Plate 52). A Tamil school for fifty local children is held in the Catholic Church compound in the south-east. Indian children at the southern corner attend the Government Tamil School at Bagan Sērai, and those at Simpang Lima and Kampong Jalan Bahru go to Simpang Lima Government Tamil School. The only Chinese School in the area, at Kampong Jalan Bahru, is an elementary school for seventy pupils, mostly from Jalan Bahru itself. No English schools exist in the area, but those at Parit Buntar and Bagan Sērai are attended by children from inside the triangle.

### WATER SUPPLY AND HEALTH

A four-inch pipe of fresh drinking water runs along and under the Sungei Siakap Road from Bagan Sērai to Kuala Kurau and is tapped nine times for public stand-pipes (Fig. 66). These public taps were originally placed where houses were clustered together most closely, and not at regular intervals, but the distribution of houses has changed and there is little correlation today between the position of stand-pipes and the distribution of houses or the distribution of shops, schools or parit junctions. Most of the people along the Sungei Siakap Road use stand-pipes. In addition, a well adjoins most houses to provide water for washing and bathing, but is only occasionally used for drinking. Ninety-eight wells were located, 38 of them being less than 5 ft. deep from ground surface to bottom, 58 between 5 and 10 ft. and two over 10 ft.

Well water here is unpalatable, either because it is too sour due to humic acid from decaying vegetation or because it is continually mixing with surface water from the padi-fields or the kampong compounds. Hence the drains and canals provide the main sources of drinking water for the people of the triangle—almost exclusively so, in fact, for those in the interior where houses are either along distributaries (*parit masok ayer*) or along drains (*parit buang*), both of which are used for drinking, bathing and washing.

Since the domestic water supply is of questionable purity, the common local diseases may be significant. According to the Government Dispensary in Bagan Sērai, the only

1. *Artocarpus champeden*.  
2. *Lansium domesticum*.  
3. *Nephelium lappaceum*.

source of factual evidence concerning health conditions in the triangle, the major diseases (in order of numbers treated in 1953) are influenza and bronchitis, neuralgia, gastro-enteritis, yaws and skin infections.

#### COMMUNICATIONS

Metalled roads form the three sides of the triangle, but the north-south road between Bagan Sérai and Simpang Lima (part of the trunk road from Ipoh to Penang), along which no weight limit is imposed, carries the largest volume of traffic. All three exert a strong centripetal force upon the life of the triangle and beside them stand most of its shops, mills and schools.

All other ways in the triangle are unsurfaced paths which chiefly follow the canals and partis in the interior (Plate 50). During dry weather many can be used by bicycles. The two paths bordering the main canal on each side are four or five feet wide and provide the most reliable means of access into the interior and so to the parit branch-paths, some of which cannot be reached directly from the metalled roads. These paths form the shortest route from Bagan Sérai to Kampong Jalan Bahru but carry no traffic heavier than bicycles.

The Main Canal has six wooden bridges crossing it (Plate 50) at points between the two concrete bridges, which carry the main roads at Bagan Sérai and Jalan Bahru.

The pattern of house-land relationship is such that movement from house to field is small. Only 427 lots (17.6 per cent of the total) have no kampong land or houses upon them.

## CHAPTER V

### LAND AND LANDOWNERS

THE PATTERN of land-lots in the triangle is regular. With few exceptions lots have elongated, geometric shapes and run at right-angles to the interior water-lines, or sometimes obliquely to the main roads. Of the total of 2,106 lots, the average size is 4.5 acres, the characteristic shape being a rectangle. Along the Bagan Sērai Road the lots are longer but very much narrower than elsewhere. No lots in the triangle exceed 34 acres (lot 1,130). Twenty-two persons (none of whom are Chinese) in the triangle own more than 10 acres, but in no case is the total acreage owned by one person reported to be as much as 20 acres.

The mukim Land Registers were examined to determine the date of the last changes of ownership. The results are summarized in Plate 54, which indicates that 591 lots (28 per cent of the total, covering 2,034 acres) last changed hands before 1915, 363 lots (17 per cent covering 2,093 acres) did so between 1915 and 1934, 427 lots (20 per cent covering 1,905 acres) between 1935 and 1944, and 725 lots (34 per cent covering 3,472 acres) have changed since 1944. The large proportion that has not changed hands since 1915 may relate to the fact that the Krian Irrigation Works opened in 1905.

An attempt was made to establish the number of owner-workers (Plate 55). Six hundred and twenty lots (29 per cent of the total, covering 2,993 acres) are reputedly owner-worked, this form being least common at the Kuala Kurau and Bagan Sērai corners of the triangle and on the waste land near Simpang Tiga in the north. Almost 80 per cent of the owner-workers are Malay and the degree of Malay control of the land is indicated in Fig. 68, which shows, besides the owner-workers, those lots (274) owned by Malays and worked by other apparently unrelated Malays or worked by Chinese (4 lots).

Several features emerge from an examination of the relationship between farm-workers and landowners. Out of the 1,578 households in the triangle which were questioned, 260 neither work nor own land. Of these, 104 are Malay, 89 Chinese and 67 Indians. Another 1,025 households (953 Malay, 19 Chinese and 53 Indian) own no land but work on other peoples' lands in the triangle. Thus a total of 1,285 households (81.4 per cent) own no land in the triangle. Only 18 households own land but work none, and two households, although owning land of their own, work other peoples' lands.

Some hired lots are rented for cash and others for payment in kind. Only 23 lots (covering 125 acres) were reported as rented in cash and 270 (covering 1,398 acres) as rented in kind. Parts of a further 33 lots (totalling 209 acres) are reputedly rented in kind (as in a family division following inheritance), and parts of 6 lots (totalling 31 acres) are rented in cash. Rent in some form or other is the tenure system in 332 lots, covering 1,703 acres, that is, 18 per cent of the total area.

## PART FIVE

### THE CHANGING SIGNIFICANCE OF PADI-GROWING IN SOUTH-EAST ASIA



## THE CHANGING SIGNIFICANCE OF PADI-GROWING IN SOUTH-EAST ASIA<sup>1</sup>

IT is easy to be so preoccupied with political developments in South-East Asia that one misses its shifting economic balance and changing function. Change has been characteristic of South-East Asia for the last hundred years, and has involved transformations probably more drastic than most in the West over the same period. Early in the last century this was a transit region—between the Sino-Pacific fringe and the Indo-European fringe of Asia—for a commerce which used South-East Asia as a corridor to be passed through as quickly as its physical obstructions allowed. Later South-East Asia became of interest for what was within it; it began to function as a source of commodities and as a consumer of manufactured goods. This function induced in South-East Asia the pattern which existed up to 1940. Politically the territory became compartmentalized into colonies of the Western industrial powers, which penetrated from the seaways and shaped South-East Asia into political units more sharply defined than previously. These units, now Burma, Malaya, Indonesia, Indo-China and the Philippines, were composed mostly of parts which had little in common politically except the link to a common metropolis overseas; often they had little economic difference except a different metropolitan focus.

### IN RELATION TO THE WEST

Profound economic changes accompanied the contact of Western and South-East Asian ways in the intimate embrace of colonialism. The metropolitan powers explored for mineral resources, injected capital into the region and established new lines of communication within and without. Tin, gold and oil were found and some agricultural commodities such as rubber, vegetable oils and sugar were developed for industrial purposes, thus giving new significance and new values to South-East Asian localities. Much less well-known is the story of spectacular transfers of native agriculture by indigenous people. During the past hundred years, over 50 million acres of virgin land have been cleared and converted into an agriculture primarily serving Asian needs. So tremendous an achievement in this area, whose forest cover is of a kind difficult to clear and forbidding even to our modern equipment, was the more remarkable because effected by simple peasant methods, neither greatly encouraged by the metropolitan powers nor aided by their equipment or their social and economic techniques. Conversions of whole countrysides to rice farming went on in this manner in new sectors of Lower Burma, Lower Siam, and Lower Indo-China.

The industrial and food commodities which were produced in consequence of both these changes involved large quantities; millions of tons of them moved overland, along the rivers and through the islands, movements made possible by reason of the West's transport revolution, in particular the steamer and the Suez Canal, which enabled bulky, low-grade materials to travel cheaply over the great distances between South-East Asia's producers and their customers, both Asian and Western.

The change to productivity was accompanied by population expansions and regroupings. People shifted to localities which had not attracted them before. The gravitation was towards the zones which, while of high agricultural value, were also in contact

1. Revised version of a lecture given at the Johns Hopkins University Conference on South-East Asia in Washington, D.C. during 1952. Reprinted by courtesy of Dean P.W. Thayer and the Johns Hopkins University Press.

with the new trading streams in South-East Asia. Fertile deltas were reclaimed and gradually filled with farmers. Older inland centres of influence shrank and regions near the ports assumed dominance. Dozens of new towns and cities came into being. Traditional rural aristocracies retained their form but weakened when opposed by rich merchant groups with different values and interests and loyalties.

This transformation made of South-East Asia an eldorado towards which millions of Indians and Chinese moved. Its industrial commodities offered wages and prospects denied them in the static economies of their homelands. Its new transport systems introduced them to Western engineering. These Asian foreigners were true colonists, who settled in South-East Asia. Nationals of the metropolitan powers were largely transient administrative or managerial personnel, and there was never more than a handful of them by comparison. The Asian colonists identified themselves with industry, trade and urbanization.

The map of South-East Asia was thus changed by new crops, new materials, new people and new ways, and by old peoples moving into new places. The region came to contain an extraordinary mixture of the ancient and the modern, standing side by side and one above the other: a conjunction of new and old was met on every plane, in the use of land, in social life, in economy and in politics. By comparison with the pattern of 1840, South-East Asia was scarcely recognizable in 1940 when its products had become of major importance to the West for its transport and electrical industries and for food-canning and printing.

#### IN RELATION TO ASIA

Whatever its function for the West, South-East Asia had a critical one for Asia. It was the only source of commercial rice. At least two-thirds of the new land brought into cultivation in South-East Asia was for padi. In consequence, rice formed by far the greatest volume of any commodity produced. A huge rice trade developed and by 1940 South-East Asia was producing nearly 20 per cent of Asia's rice and contributing more than two-thirds of all rice in international trade.

The conversion of South-East Asia into a large-scale rice producer took place at a time when the rice-eating populations of India, China and Japan found their own food-growing capacity reaching its limits. At the opening of the twentieth century most Asian countries were not far from self-supporting in rice. India, China and Japan brought in foreign rice chiefly to offset the vagaries of their own harvests. South-East Asia functioned for them as a safety valve, an insurance against fluctuating harvests at home. When the Far East began industrializing and urbanizing as the century advanced, their degree of self-sufficiency steadily lessened. The need of India, China and Japan for external rice became chronic rather than occasional. Their industrialization was only possible providing South-East Asia continued as a rice exporter—and at low prices. Their first steps in industry were based on labour of a cheapness offsetting its other limitations. As the rice granary for the countries of the East, South-East Asia therefore had a function more vital for their domestic and economic stability than were the industrial commodities it provided for the Western world, which had alternative sources and substitutes.

#### SUBSISTENCE FARMING

The peasant who produced South-East Asian rice aimed for his family and helpers, if any, to be fed directly by the rice grown from his fields. His was the subsistence mode of farming. Workers in the rice fields ate much of what they grew, as opposed

to the Western mode of selling the whole crop for cash by which the farmer's food is brought and labourers paid. Commercial or cash farming gives flexibility and purchasing power, opening a wide range of foods and other necessities to all concerned: the subsistence system limits a farmer's diet to what his ground can produce, narrowing its range, though mostly providing ample quantity.

From his crop, the rice farmer paid dues in kind and then sold what was surplus to the feeding of his family. The rice in trade was made up of the small surpluses derived from these dues in kind and from the excess to farm consumption, the two being related. The farmer could accept low prices for his surplus because his basic needs and those of his helpers had been met before the rice left his farm. Thus the rice flowing to international trade did so at prices not geared to the true costs of production. As a surplus, it could be sold by the farmer at a price not based on the monetary value of labour, work and time needed to produce rice. In this sense South-East Asian rice was being marketed at a price which was not economic. Our conception of South-East Asia as a source of cheap food developed because the full costs of producing rice were concealed from the market by the subsistence system. Since the price of rice was not an approximation to its economic value, the structure of costings in South-East Asia was fallacious. The cost of living for Asians in the towns and industries, dominated by their consumption of rice, only appeared to be low because their staple food was not priced on the same basis as the foods—wheat or potatoes or meat—upon which Western costs hinge.

#### THE POST-WAR RICE TRADE

At least three-quarters of South-East Asian rice-farms were cultivated on the subsistence mode by 1940. Today the proportion is not likely to be very different. The Far Eastern War and its train of events modified rice production in proportion more than in pattern. After only a brief decline, the overall acreage under padi in the whole monsoon fringe has risen to nearly 10 per cent above that of pre-war days; the reported production totals as high as before. In Burma and Indo-China, about a quarter of the padi-land is still out of production. The subsistence mode helped to buffer rice from the paralysis of war-time disruption, and the overall acreage and production in South-East Asia were only slightly down for the first post-war quinquennium as compared with the last pre-war one. Novelty is most apparent in the surplus. The amount of rice now moving into international trade from Burma, Siam, and Indo-China is barely half what it was in the late thirties, though there are at least ten million extra people in the deficit areas of South-East Asia, and probably fifty million more in other Asian rice-eating countries.

Part of the explanation for the diminished outflow is, of course, the substantial increase of populations within the surplus countries. Each is eating more of its local rice. This is a permanent feature. A rice surplus disappears fast in a subsistence farming whose wet technique remains more horticultural than agricultural. Today, between the South-East Asian producer and the international market stand not only the new mouths in his family but also armed men; whether these be bandits, gangs or armies, they require to be fed, thus stealing or absorbing the surplus from the cultivator. Even if we expect these to be disbanded in time, the members of the groups will be there in one form or another and, not being in general producers of food themselves, they will still need to be fed, albeit on a more conventional basis. The landlord has retreated or been eliminated from the countrysides of Burma, Indo-China and Java; he no longer

receives his rent or dues in kind, which formerly induced many farmers to obtain a surplus and added to the flow of rice into commerce. Redistribution of land, legal or otherwise, removes this inducement. Agrarian reform in a subsistence context, while possibly filling bellies, thus lends weight to the argument that the flow of rice into trade must continue to decline unless other changes take place.

We must be reminded that the areas previously having rice surpluses were in each country very small in proportion to the planted acreage. None of the rice-exporting countries of South-East Asia had extensive regions of surplus comparable to the Middle West and Australia. Because of their horticultural technique, those sections where the average density of population per cultivated acre is more than about one have no surplus, and few localities in South-East Asia now have nutrition densities that low.

These are constant factors likely to restrict rice surpluses even when internal transport becomes easier. They justify us in thinking that South-East Asia is within sight of no longer providing rice exports to the Asian world.

For what rice surplus there is, the increased populations everywhere in Asia stimulate an unprecedented competition among buying countries. India and Japan must obtain some of it on humanitarian and political grounds to hold down the drift towards wage disputes and disorder in their urban areas. China would be in the same position if it were not for its Bamboo Curtain. Malaya is, as ever, bidding for international rice because it specializes in the production of industrial raw materials. Indonesia and Ceylon, now less self-contained in rice, are major bidders also. Political and currency problems lead the governments of all territories concerned to an active interest in the rice market. In Burma and Siam, government agencies monopolize the surplus rice of their nationals. The governments of deficit countries negotiate purchases of rice from the governments of the surplus countries. This is entirely a post-war development. It gives some governments the power to play politics with the foods of millions, even though their expressed object is to eliminate private exploitation of the situation. The price at which the government agents handle rice works in two ways. By it the surplus areas set something like a pegged price for their domestic producers. In deficit countries, the government selling-price operates to keep down the urban price of rice and sets a level towards which gravitates the price expected by domestic producers for their surpluses. A trend back to private trade in rice is developing in 1955 but is as yet by no means general, and the effect in deficit countries has generally been that the price settles to something between the former controlled and black-market rates.

Together with this change of character, there has been a change in value. Rice has risen to incredibly high prices. No other grain has so steadily advanced on the international market since the war. In 1939 South-East Asian rice traded at about £7 sterling a ton: in 1945 governments were purchasing from Siam and Burma at about £17 a ton and private dealers were paying more. The 1952 crop in Rangoon was marketed from government to government at £50 a ton. Today early in 1955 at Singapore, the one free port of South-East Asia where there are no government controls at all and prices find their own levels, average quality rice changes hands wholesale at about £56 a ton. Thus for sterling countries, rice has multiplied its trade price at least eightfold from 1939-55. Over the same interval wheat prices have increased only about threefold in the United States. South-East Asian milled rice today trades at about two and a half times the price per ton of wheat in Chicago. At such price levels, a rice diet is practically a luxury.

Thus South-East Asia has ceased to be a cheap supplier of Asian food, and we must weigh the implications. If economic conditions of the kind which apply in Western agriculture operated among South-East Asian rice producers, prices of this new order would cause rice production to expand. They do not. The subsistence context prevents high prices operating quickly as an inducement for the same reasons and to much the same extent that it prevents low prices acting as a deterrent.<sup>1</sup>

A more immediate effect is that the rice-surplus governments now find rice the chief source of their funds and their chief political strength at home and abroad. The government of Burma, which country has the simplicity of economic structure characteristic of South-East Asian states, depends for its income more on direct profit as a rice trader and less on revenue by taxation. The Burmese and Siamese governments, now the chief rice exporters, have thus a strong inducement to maintain a high price.

#### NEW LEVELS OF COSTS

By remaining consistently expensive this grain has raised the cost of living for South-East Asian urban and industrial workers, the more so because the Asian habitually takes a far larger proportion of rice in a meal than an American or a European takes of any one item in his diet. Other local food produce has moved higher in step with rice. Local eggs in rural Malaya, for example, have frequently been more expensive over the last few years than those of higher quality in the United States. In several South-East Asian countries the cost of living has multiplied four times compared with pre-war days. In Siam and Indonesia, the one a surplus and the other a deficit rice area, the cost of living has moved to even higher multiples, complicated further by currency changes. In India and Ceylon it has more than trebled.

These changes in the value of the South-East Asian staple food show little sign of reversing the trend we have been tracing. To import food, principally rice, India in 1952 spent three times as much as in 1950-1, and this despite a lower return from its raw materials and industries. Costs of labour and processing in South-East Asia are taking on new proportions. Producers of raw materials find that their costs, tied as they must be to the price of rice, have little resemblance to pre-war figures. External pressure on them to restore the selling price of rubber, tin, vegetable oils and sugar to levels approaching those of pre-war days is worsening the internal situation. South-East Asian labour employed in these industries is often caught in the cross-fire of a form of economic warfare conducted by other governments. The United States, the greatest single consumer of South-East Asian products, lowers its bids for industrial commodities at the same time as Asian governments lift their offering price for rice, backed by the argument that they must raise the economic return of their own people. There is grave danger that this will end in the collapse of most existing commodity producers and of the factories and local industries which have been encouraged with the object of raising local standards of living. Factories, businesses, utilities, plantations, mines and governments in South-East Asia find their costs have risen steeply and that the cost of rice-eating labour is the critical component.

South-East Asia has clearly ceased to be a region of cheap labour. By its influence on rice exports it affects costs in town and industrial life in other parts of Asia, which, therefore, is ceasing to be the continent of cheap labour and cheap processing.

1. *The Rice Production Report* (1953) showed (paras. 51-63) that in Malaya, where forms of commercial agriculture (rubber, oil-palm, etc.) are carried on not far from largely subsistence padi-farming, a guarantee by the local government to purchase domestic padi at a price-floor roughly equal to the international trade price, has not operated to cause an increased acreage or output.

## INCENTIVE AND RESPONSE

Nothing could be a greater incentive to mechanization than these new costs. The mechanical method is, however, slow in appearing in rural South-East Asia. Its chief industrial commodities, rubber, sugar and the vegetable oils, do not readily lend themselves to mechanization. In rice farming, mechanization is almost non-existent, though experiments are going on at a number of points. The subsistence-horticultural mode and related social factors weigh heavily against the mechanization of rice in addition to matters of capital and to the technicalities of wet cultivation. But at the new prices rice-farming offers substantial rewards as a commercial proposition, and possibly the mechanized approach is not far beyond the present horizon, though not in the present rice-growing regions. While promising mass production, mechanical farming on existing rice-lands offers no solution to the problem of what to do with the labour it must displace; it offers greatest promise in new places.

Its expanding demand and maintained high price cause rice to draw the interest of farmers in other parts of the world. It has become commercially attractive now to regions where it has no heritage, no restriction to old methods and no inertia of society or population to impede profitable forms of production. Since the war, British Guiana and Australia have been exporting rice at well below South-East Asian prices, though not in great volume. A general increase of rice acreages outside Asia has become apparent. By comparison with 1940, Asia in 1950 had added thirteen million acres to its padi-lands; the rest of the world in that time added seven million acres. Over the same interval, Asia's annual padi production increased by about two million tons: that of Brazil alone increased by more. In 1940 less than five per cent of the world's padi-land was outside Asia; today about eight per cent of a greater world total is outside Asia and rice-growing is further from being an Asian monopoly.

The failure of South-East Asia as a whole to respond in the way other parts of the world have done, underlines the fact that its subsistence system of rice-growing is more a mode of living than an economic means of production. In territories outside Asia, rice-growing is a business. The self-contained mode of South-East Asia acts to restrict the buying interest as well as the buying power of its farmers. Normally they show little wish or pressure to buy anything. It might go a long way to stimulate them to sell more rice if we could rouse their wish to buy. That was part of the function of the middleman in the past: he provoked and encouraged the buying appetite of the peasant as part of the process of bringing him to sell his rice. The salesman function of the much abused middleman stimulated the outflow of rice, and by eliminating him one spur to it is removed.

These factors all contribute to the tension that is building up in South-East Asia. The urban and more vocal workers face an increasing shortage in their staple food at a time when a higher standard of living is expected and is still being promised by those who woo them, whether Left, Right or Centre. The West cannot ignore the consequent unease and, if existing systems do not permit or encourage some kind of planning to eliminate the deficit, the West will need to take action in sheer self-preservation. Economic breakdown is a contagious disease that can take ten thousand miles in its stride.

## CAN ASIA GET MORE FOOD?

Four methods of expanding Asian food supply can be envisaged: increasing yields on existing farms; increasing the flow of foods from other parts of the world; increasing the range of diet among Asians; and increasing the acreages under padi.

To increase yields sufficiently to be relevant requires us to reach the peasant and teach him; illiteracy, prejudice and inaccessibility make it difficult and mostly impractical for the West to take part in this. The peasant, we must remember, is already convinced—he has been pressed to raise yields at most points to maintain his extra dependents. Effort to this end from within must be continued in the existing padi-fields, if only to keep pace with increasing populations around them; yet it can make little difference to present rice-deficit areas or to urban needs.

The flow of foods from elsewhere has started. Rice has been moving into South-East Asia from the United States, Brazil, Egypt and Australia. Substantial tonnages of wheat and flour are being absorbed by Indonesia, Indo-China, the Philippines and Japan. Because wheat producers respond readily to changes in demand, this trend reminds us how pressure from the padi-fields of South-East Asia becomes transferred to the wheat-fields of the Americas or Australia, and that such pressure may increase.

Here is a sign that the eating habit of Asians can change, especially among the people accessible in towns and industries. By these methods the range of South-East Asian diets is extending. Slices of bread covered with tomato, chili or fish-sauce are now to be seen in the hands of children and artisans in Malaya. Potatoes are regularly used in curries. Corn as a vegetable and as a sweet is more popular. An expansion of off-season maize growing is developing where fields are suitable, though only the Philippines and Eastern Java do so on a large scale at present. Not all padi-fields permit off-season use in this way.

But it is the remedy of increasing the acreage under padi-land which appears to lend itself best to Western or Western-trained technicians. Hitherto the creation of new padi-lands has been chiefly by peasant methods involving a few acres per person, scarcely more than keeping pace with the population and often confined to the margins of existing rice-lands. It has been tried also by the process of resettlement, shifting people to small-holdings in new areas, only to find the locality fill with people at a rate nearly equalling that of the extra acreage created. The correlation between population and acreage in the context of subsistence small-holders works to that end. No surplus of a major order comes from that device alone. A high output per person engaged must be the objective if we are to get food to the urban and industrial markets. The mechanized attack on new territories on the basis of commercial rice-farms has yet to be tried, though it does offer an expectation of high production, given virgin land, regional planning and a small cadre of skilled farmers.

Are there any places left which suit this approach? South-East Asia still has them. The deltas of Borneo and thousands of square miles of swamp in East Sumatra are lying practically empty, suiting rice cultivation and calling for regional planning such as international action, whether capitalist or collectivist, makes possible. Except for a few colonies of transferred small-holders in Mindanao, South Borneo and South Sumatra, those regions are gaping holes in the pattern of South-East Asian production, neglected hitherto because of the limited human groups in the uplands behind them and because rice prices have been uneconomic. They offer today the prospect of restoring to South-East Asia its functions as a pioneer area, as a surplus rice producer, as an experimental ground for Western technology and as a safety valve. There is ample opportunity for transforming the land-use map of large sectors of South-East Asia, as the Burmese, Siamese and Indo-Chinese did not long ago under different sociological conditions and with much more limited power to attack their difficult terrains. We may think too of the virgin spaces round the Congo and the Amazon where rice will also grow, though distance from the Asian market debars them from first consideration.

What is the outlook in rural areas of South-East Asia where a rice-surplus is already being produced? The restoration of transport and communications in those countries will carry to the rice-farmer news of the price his government gets for exporting his rice. That is certain. Whether these two factors will lead to a significantly greater outflow is open to doubt. If they do, the price may drop a little, though the long-term outlook for this grain suggests it cannot drop far. If they do not, the rice-farmer will want part of the high price passed down the line to him for what little fraction of his crop he can sell. Governments may find this most desirable. It is the natural means for spreading purchasing power in the rural areas, where the new independencies face the same problems as the old colonial administrations; their farming regions have a high production but a small turnover, little internal trade, and therefore little upon which taxes may be based to provide revenue. Revenue these governments desperately need. Without it they have no means of fulfilling the promise upon which they floated into power. They might well solve the problem not merely by passing on the price, but by working to convert the padi-farmer into a commercial farmer, accustoming him to the idea of selling all his crop and purchasing all his needs. That way lies the one hope of giving the Asian farmer fair value for the time and labour put into his crop. His purchasing power will broaden the basis of life for the rice-grower, giving him the whole world to draw upon for food—much as the wheat-farmer of the Middle West can purchase greater variety of food than the one or two crops his kind of land produces. That way lies hope of diversifying the food intake of rural Asians and spreading what rice there is among greater numbers who will supplement it with a range of other foods.

Exploring their own mode of production on lines like these, the new independencies may find complete commercialization of rice to be the long-awaited device to induce money flows and trade in their territories, to widen their economy and lead them out of the impasse of having productive land and industrious people, but no revenues. No other solution is more than a palliative, a mere tinkering with the out-dated and defective machinery of the subsistence system, which is less degenerate in South-East Asia than in India, China and Japan.

For the rest of the world, if rice production, by reason of its new price levels or by governmental direction, be transformed into a money economy, besides removing the threat inherent in so many people living without adequate reward for their work, it must create in South-East Asia an enormous capacity to purchase. In that way South-East Asia can help to solve also the problem of the industrial world, that is, how to find markets large enough to use up mountains of products without wasting them in a continuous state of war.

## APPENDIX I

## UNIVERSITY OF MALAYA PADI SURVEY

*Director*

E.H.G. DOBBY, Ph.D., Professor of Geography

*Supervisor*

B. W. HODDER, B.Litt., M.A.

*Field Surveyors*

Bagan Sērai, Krian	...	...	Saw Huat-lye
			Tan Soo-hai, B.A.(Hons.)
			George Seow, B.A.(Hons.)
			Mohammed Yunus bin Hanifah, B.A.(Hons.)
			Lokman bin Musa
			R. P. Jegaraj, B.A.
Mukim Four, Province Wellesley	...	...	Hamzah bin Sendut, B.A.(Hons.)
			Hashim bin Aman, B.Sc.
			Shim Kah-foo, B.A.(Hons.), Dip. Arts
			Lam Kok-hon, B.A.
			Soh Kai-choo, B.A.
Mukim Dulang, Kedah	...	...	Osman bin Cassim, B.A.(Hons.)
			Victor Gopal, B.A.
			Victor de Bruyne, B.A.(Hons.)
			Murad bin Mohamed Noor, B.A.
			Peter Wee Kim-eng, B.A.

## APPENDIX II

## PADI SURVEY QUESTIONNAIRE

Date ..... Mukim ..... District .....

1. Name ..... House number on map<sup>1</sup> .....  
Lot number of house .....
2. Number of years in present house .....
3. Number of occupants: males over 12 years .....  
females over 12 years .....  
total children under 12 years ..... } Total .....
4. Type of house ..... Racial and Community Group .....
5. Has head of the house lived in this district all his life? .....  
If not, when did he come? .....  
What was his previous work? .....  
Whence did he come? .....
6. Usual drinking water: tap ..... well ..... river ..... canal .....
7. Depth from top to bottom of well .....  
Depth from top to water level .....
8. Period when water in well/stream is lowest ..... highest .....
9. What are the arrangements when water is inadequate? .....  
.....
10. Which month has (a) most rain? ..... (b) least rain? .....
11. Lot numbers of fields { owned .....  
worked .....  
Landlord's names and address .....
12. Lot numbers of fields subject to a *padi kunchah* arrangement .....
13. With whom is *padi kunchah* arranged?  
His address or house number .....
14. Is any lot rented in cash or kind?  
Is any lot shared?  
If so, in what proportion is the crop shared? .....
15. Main crop grown on each lot .....  
Are crops chiefly for cash sale or for use in the house? .....
16. Other crops .....
17. Estimated average yield per acre of { irrigated padi .....  
unirrigated padi .....

1. Survey Office Lot Map. Scale: 4 or 8 chains to one inch.

## APPENDIX II—continued

18. Timing of cultivation

	Seeding	Transplanting	Harvesting
First padi crop	.....	.....	.....
Second padi crop	.....	.....	.....

19. Number of extra workers at peak season

(a) hired for cash .....
 (b) hired on share basis .....
 (c) friends .....

20. What other work is done in off-seasons? .....Where? .....

21. Livestock on holding: kind .....number .....

22. Which owned lots are irrigated? .....Source of water .....Method of paying for water .....

23. Farmer's suggestions for improving each lot ..........

.....

24. Fertilizers used on padi-lots: .....Amount .....Frequency .....

25. Chief farming implements in use .....Home-made or bought ..........

.....

26. Where do farmers *initially* market or mill their produce? ..........

27. Mode of transport of produce ..........

28. Methods of storage on farm .....Total capacity of store (in *gantangs*) ..........

29. Winnowing period .....Which wind direction is most suitable for winnowing? ..........

30. Lot(s) which give(s) highest yields .....lowest yields ..........

31. Which crop pests occur? .....When are they most troublesome? .....Which factors { encourage them? .....discourage them? ..........

32. Methods used to destroy pests ..........

33. Periodicity of local market-days ..........

34. Are there any cottage industries? .....If so, where are the products traded? ..........

*APPENDIX II—continued*

35. Changes which the farmer can recollect in:

(a) land use .....

.....

(b) population .....

.....

(c) house distribution .....

.....

(d) transport .....

.....

(e) water supply .....

.....

(f) other matters .....

.....

### APPENDIX III

### LAND OFFICE INFORMATION

To be completed for each lot recorded  
in the Padi Survey Questionnaire

From the Mukim Register or the District Office  
*(Delete as appropriate)*

## APPENDIX IV

## RICE-MILL QUESTIONNAIRE

Date .....

Name ..... Address .....

Number of persons employed { permanently .....  
at peak season .....

Maximum padi storage capacity .....

Power and fuel used .....

Monthly flow of padi to mill

	J	F	M	A	M	J	J	A	S	O	N	D
1952	..											
1953	..											
1954	..											

Distance of furthest farm sending to mill .....

Normal locality of farms sending to mill .....

Destinations of milled rice (weights, proportions) .....

.....

.....

.....

.....

Monthly production (sales) of milled rice

	J	F	M	A	M	J	J	A	S	O	N	D
1952	..											
1953	..											
1954	..											

Other business besides milling .....

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- (a) in advance as loan .....
- (b) cash on delivery .....
- (c) retaining portion of rice for milling service .....
- (d) other means .....

Does the miller own any padi-land? ..... If so, which lots? .....

.....

.....

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PART SIX

ATLAS



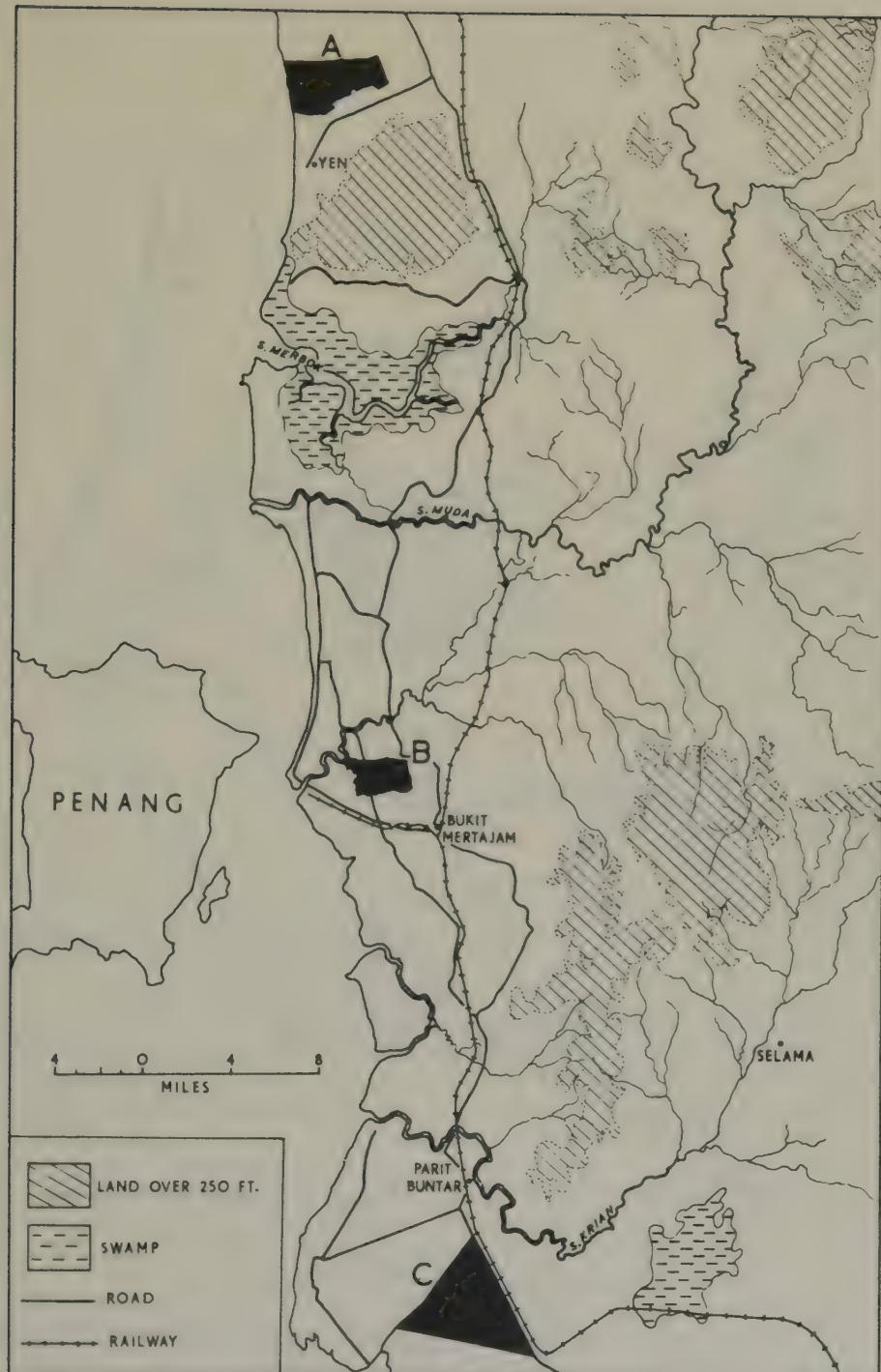


Plate I. The positions of the surveyed areas in North-West Malaya.

- A. Mukim Dulang.
- B. Mukim Four.
- C. Bagan Sērai triangle.



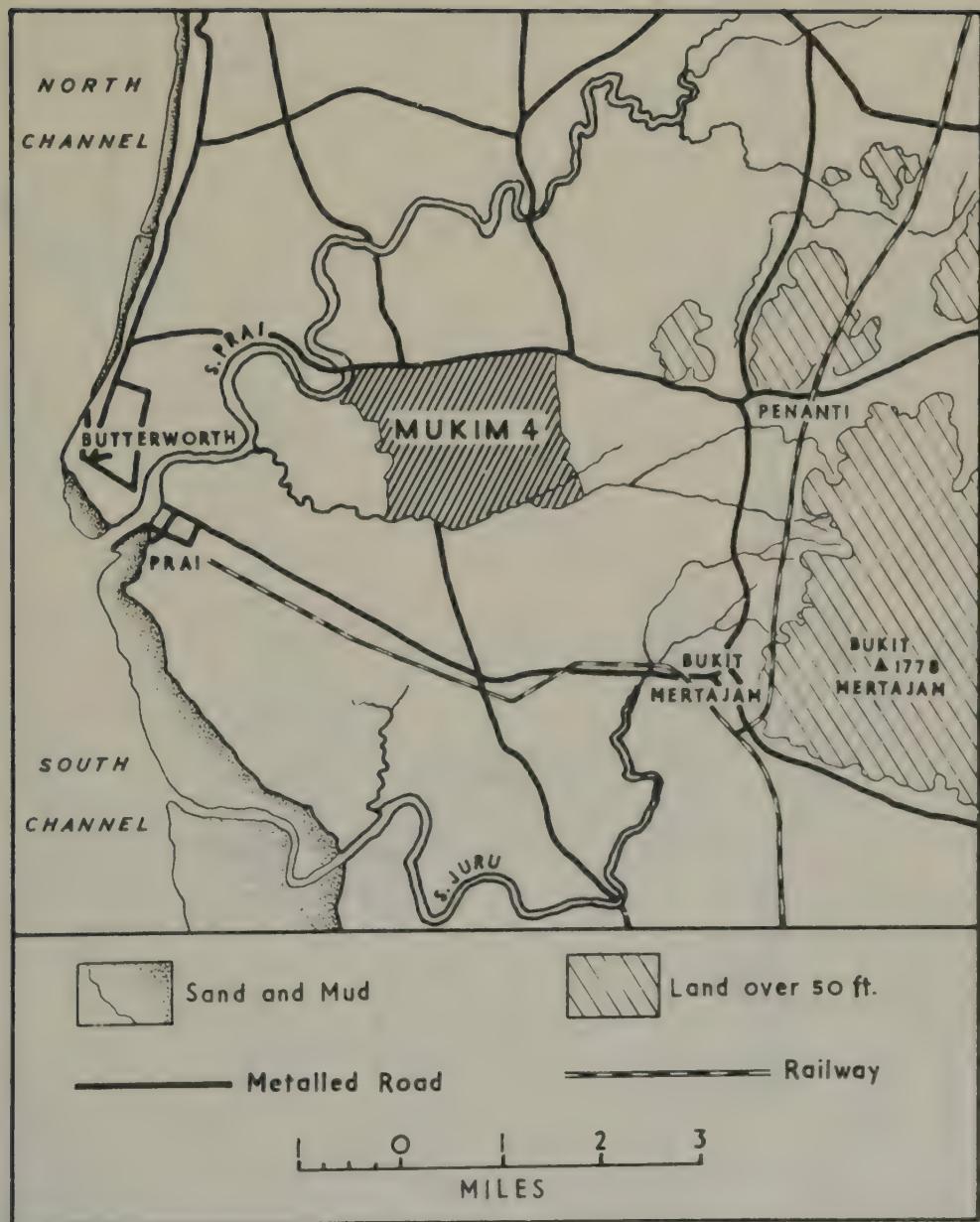


Plate 2. The position of Mukim Four in Province Wellesley.



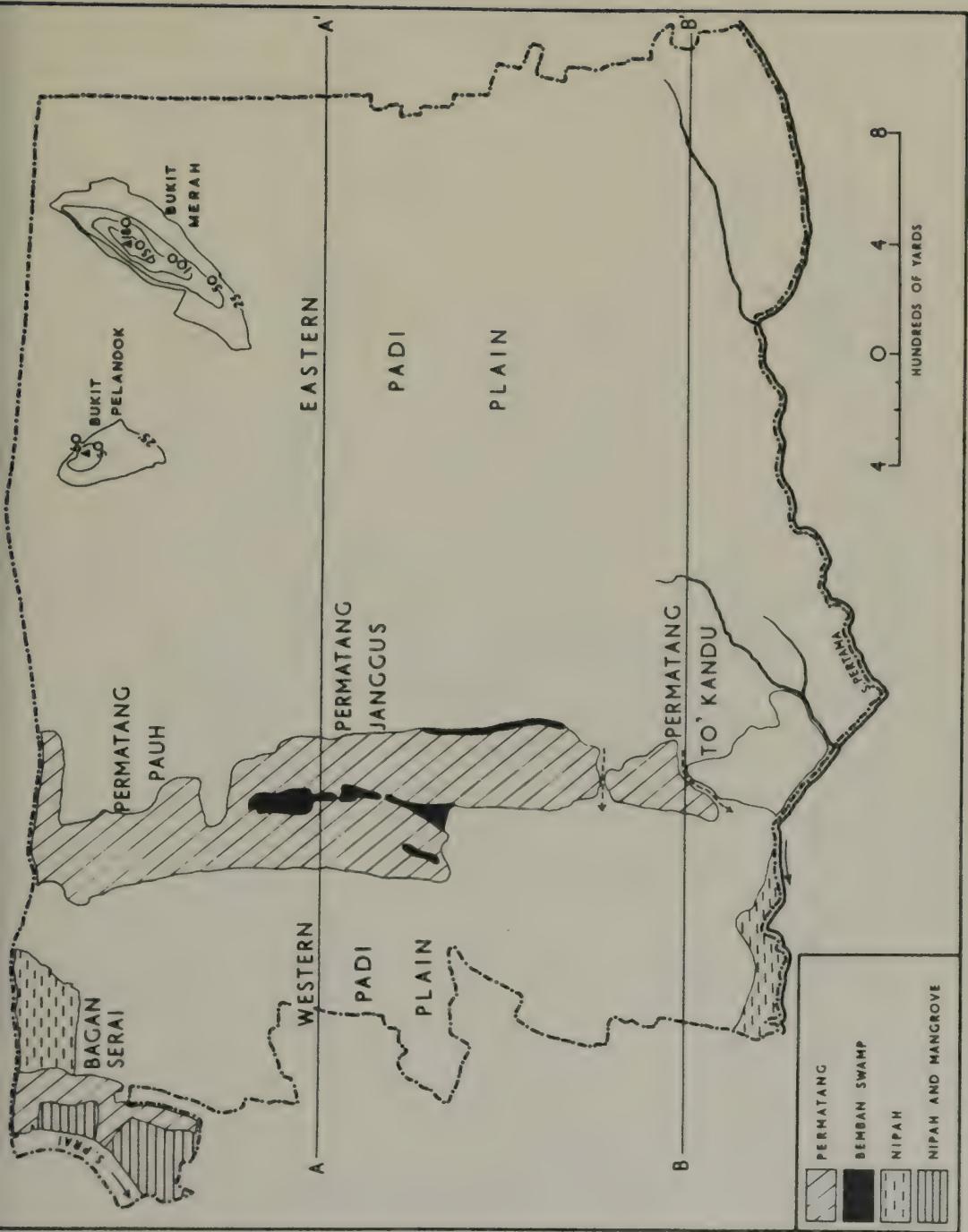


Plate 3. Mukim Four: relief, vegetation and natural drainage. Channels draining surplus water from the eastern to the western padi plain are shown diagrammatically by arrows. A-A and B-B are the lines of the topographical sections shown in Fig. 1.



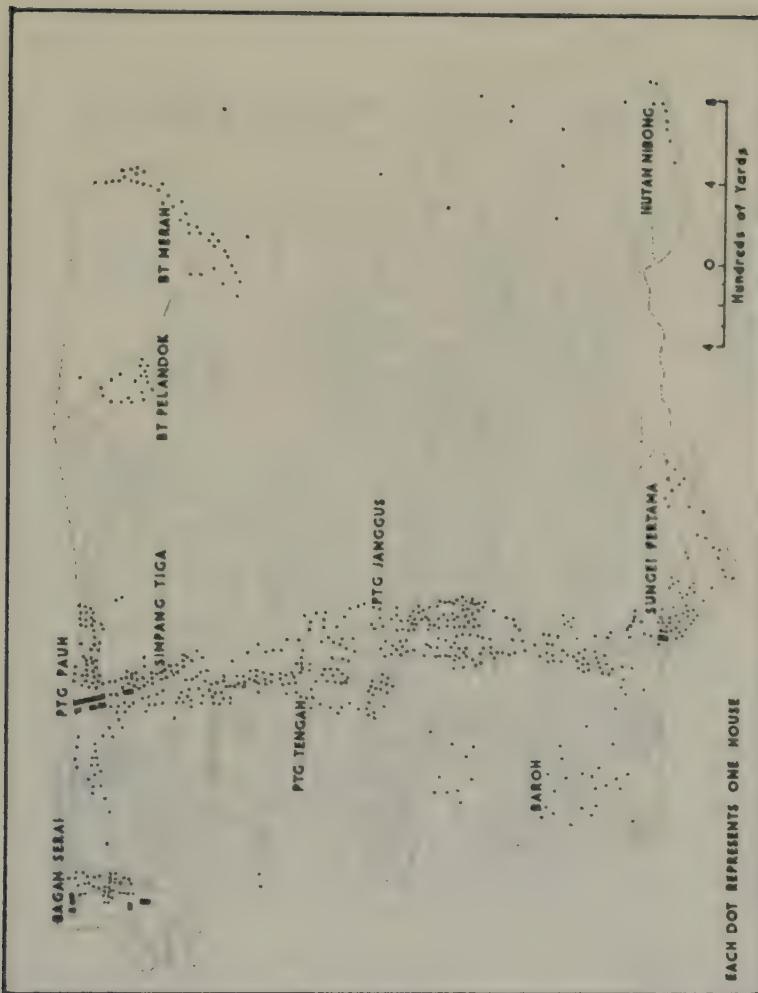


Plate 4. Mukim Four: distribution of houses. Shop-houses are shown as black rectangles.



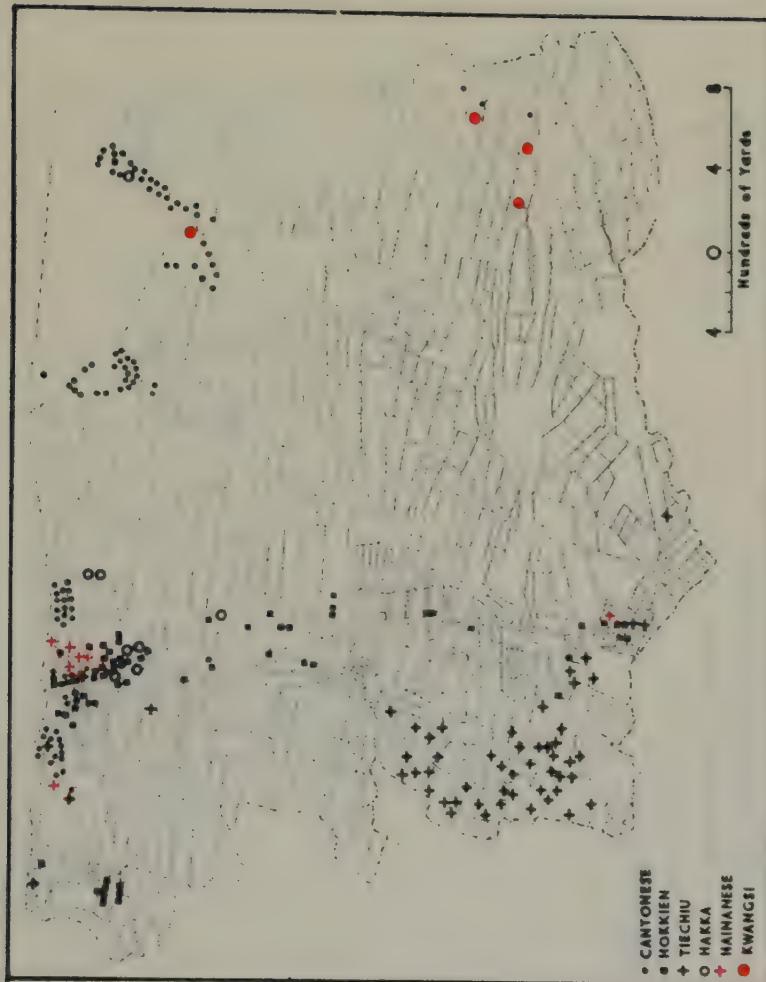


Plate 5. Mukim Four: distribution of Chinese by clans.



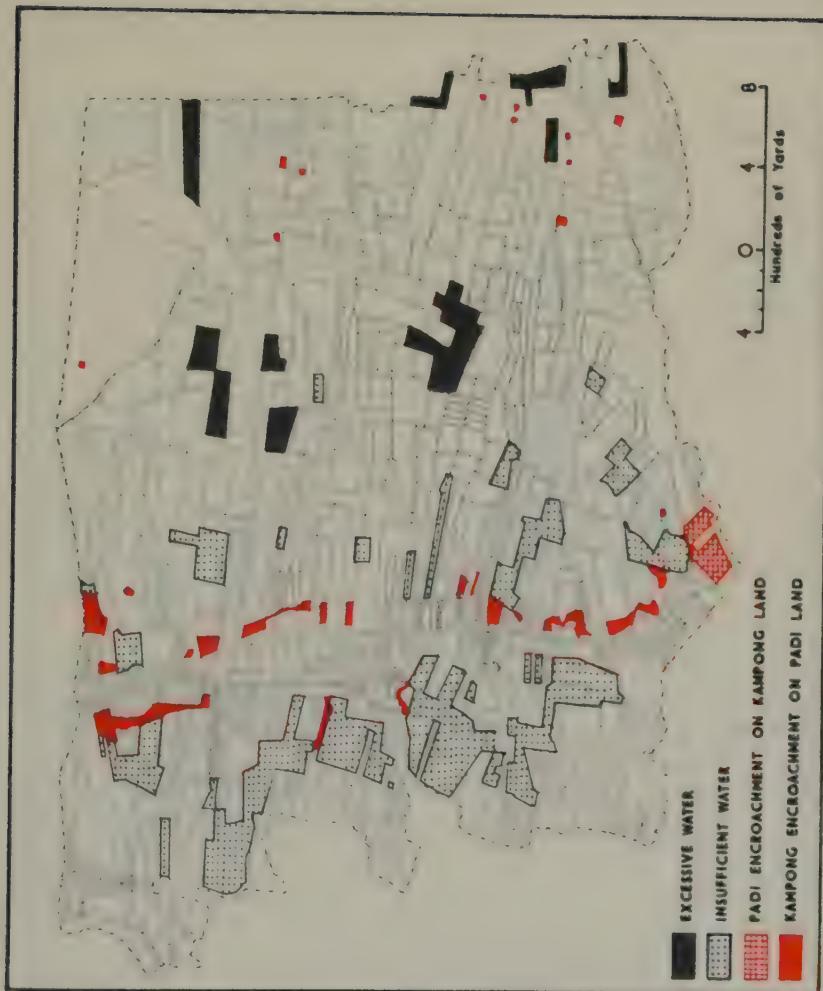


Plate 6. Mukim Four: (1) areas of excessive and insufficient water  
 (2) recent changes in land use on the padi fringes.



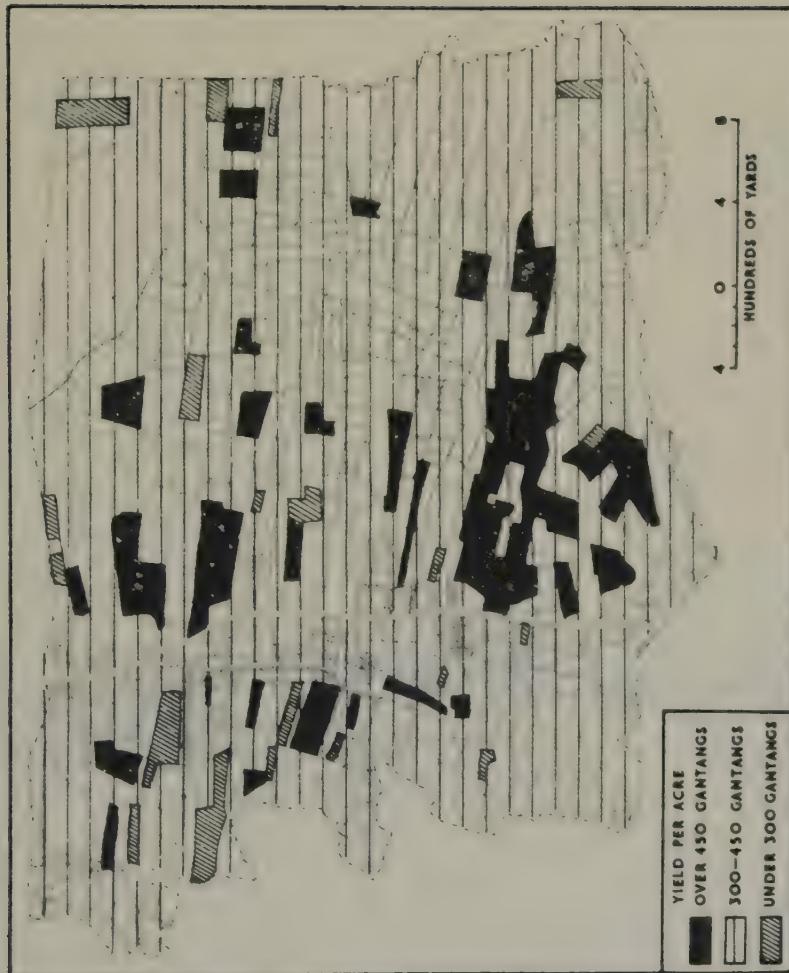


Plate 7. Mukim Four: yields of *malayan* padi. Yields of the *taivian* crop are not plotted, but nowhere do they exceed those of the *malayan* crop.





Plate 8. Mukim Four: house types.



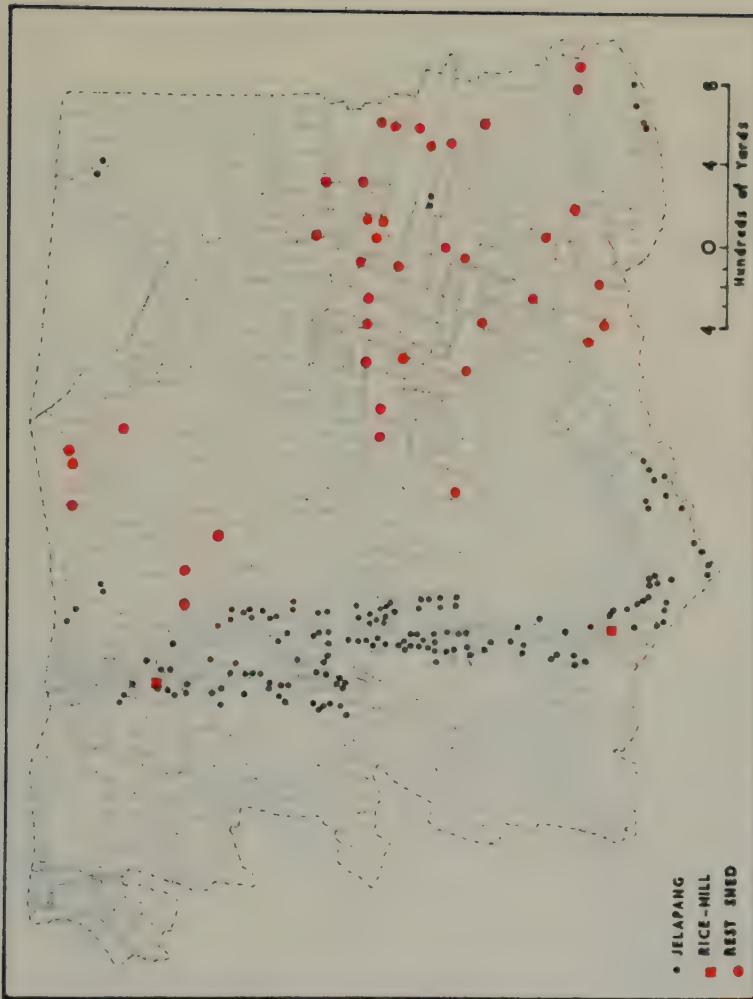


Plate 9. Mukim Four: distribution of jelapang, rest-sheds and rice-mills.



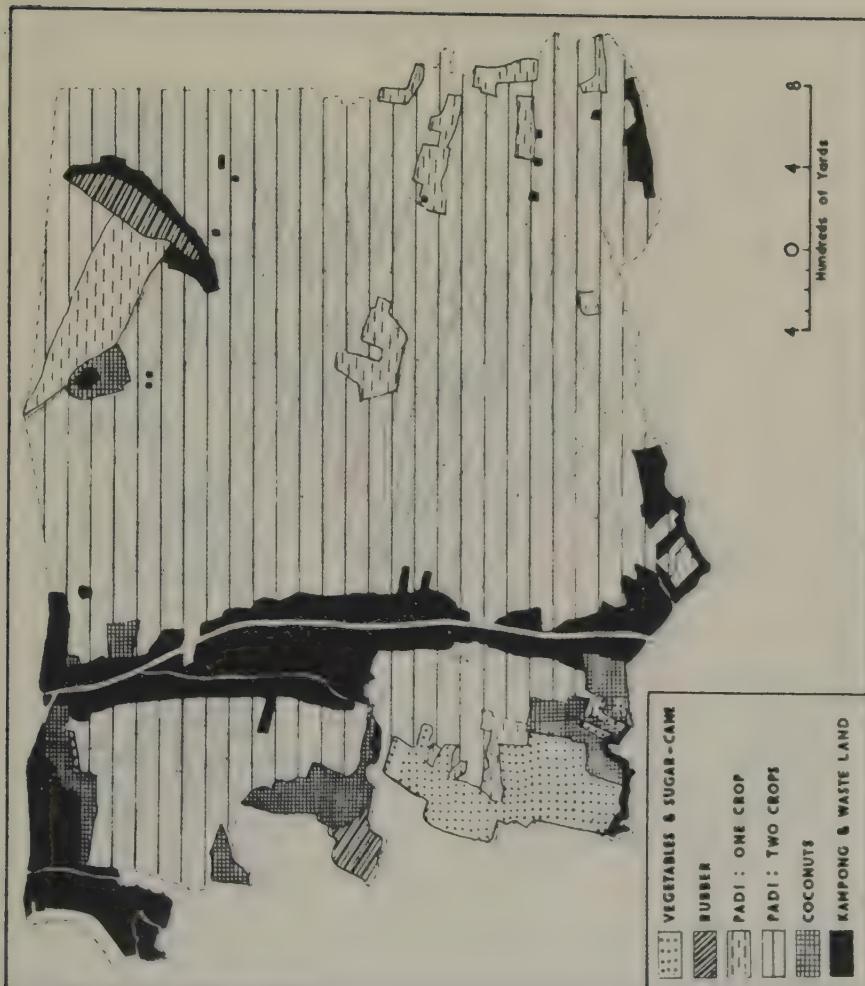


Plate 10 Mukim Four: land use.





Plate 11. Mukim Four: last change of title for each lot according to the Mukim Land Register. No information could be traced for those lots left blank.



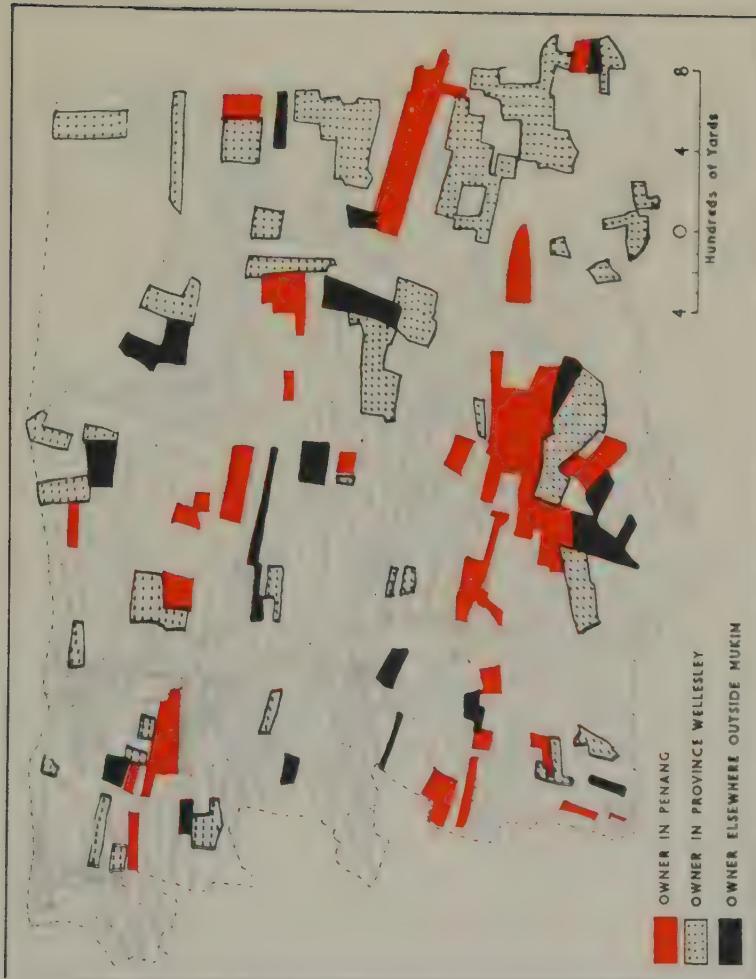


Plate 12. Mukim Four: the place of residence of each lot-owner. Unshaded lots are the property of persons living in this or an adjacent mukim.





Plate 13. Mukim Four: padi-lots reputedly worked by their owners.





Plate 14. Mukim Four: payment of rent. The south-western area of cash rents can be correlated with the distribution of Tzechu vegetable gardeners (cp. Plates 5 and 10).



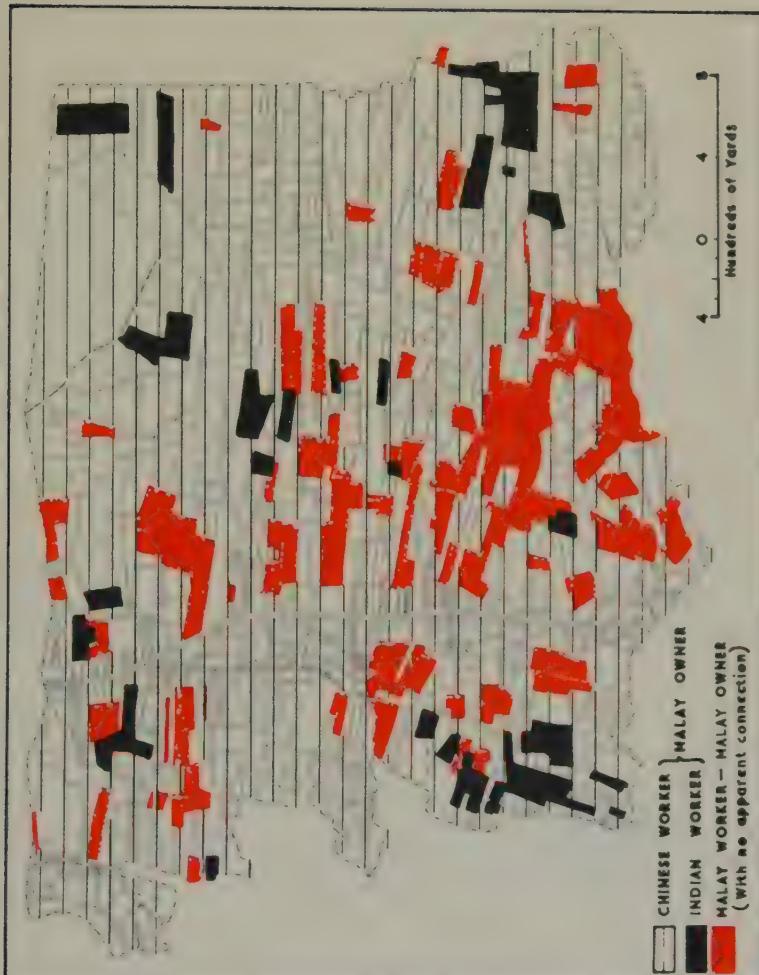


Plate 15. Mukim Four: Lot ownership by race. Malay holdings worked by the owners are not included.



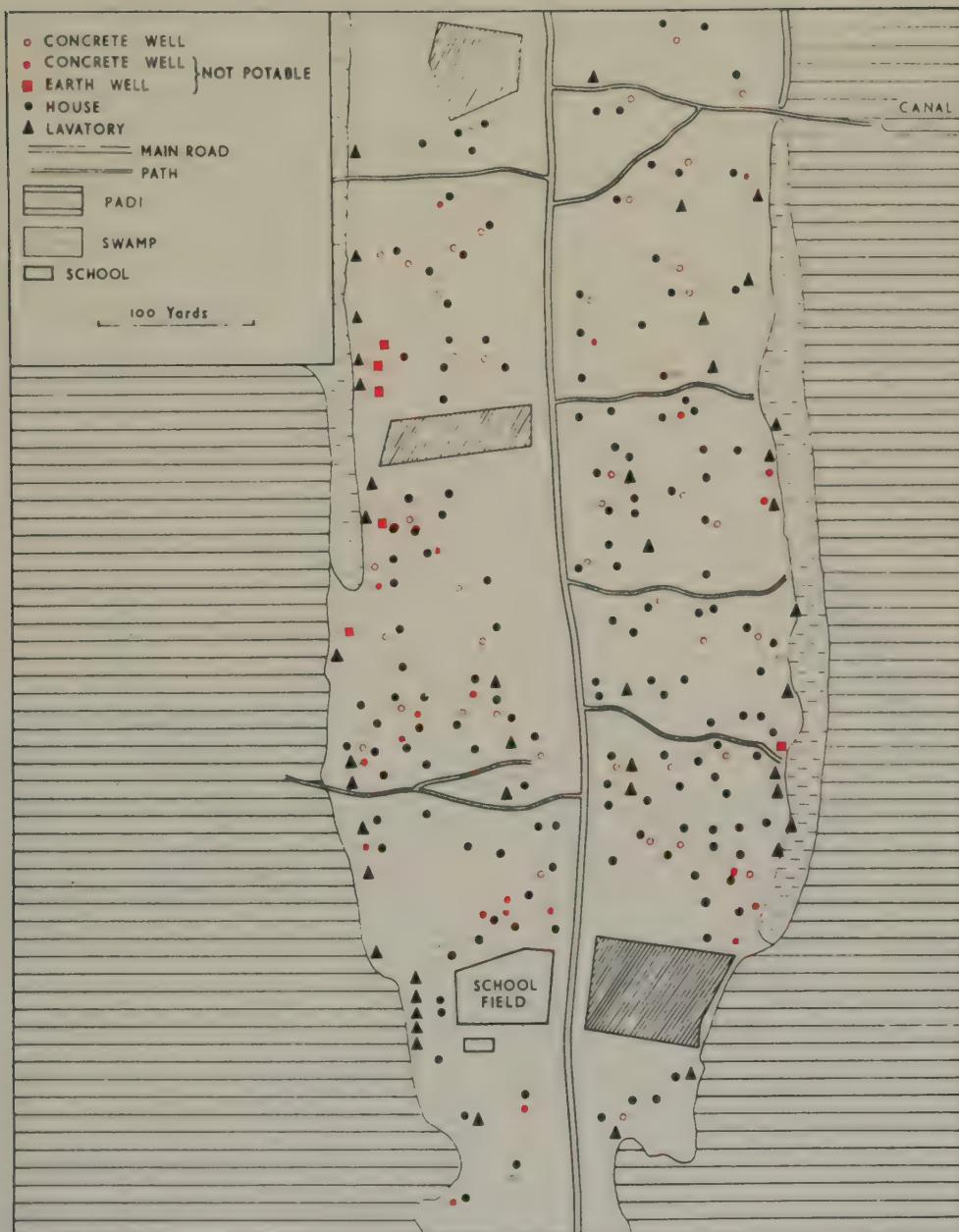


Plate 16. Part of Permatang Janggus Village, showing the distribution of houses, wells and lavatories. The shaded areas are Muslim burial grounds.



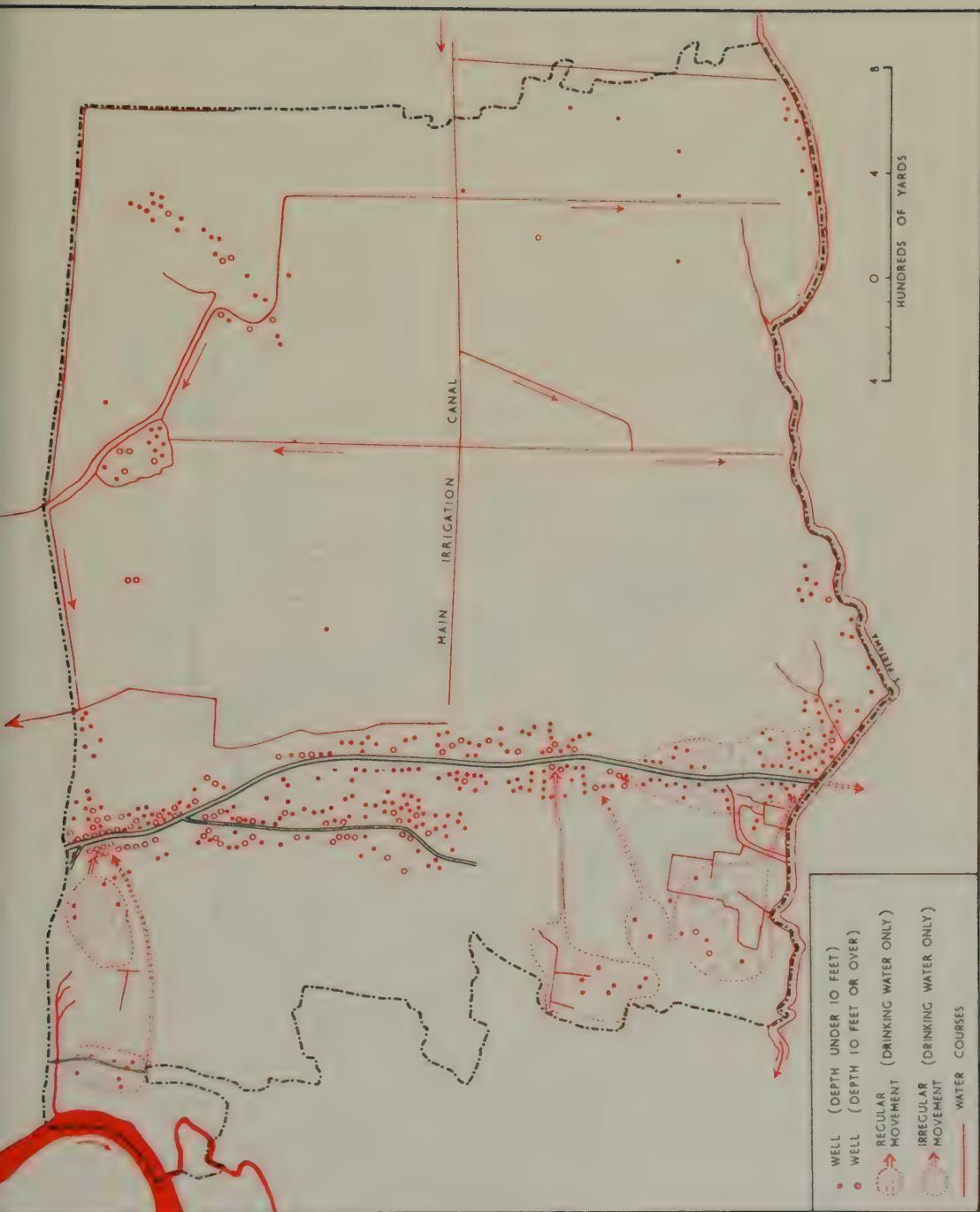


Plate 17. Mukim Four: the distribution and depths of wells (drinking-water only).  
Note the deeper wells in the north.





Plate 18. Detail of Permatang Pauh Village. The shaded area is the property of the Ghee Bee Rice-Mill.



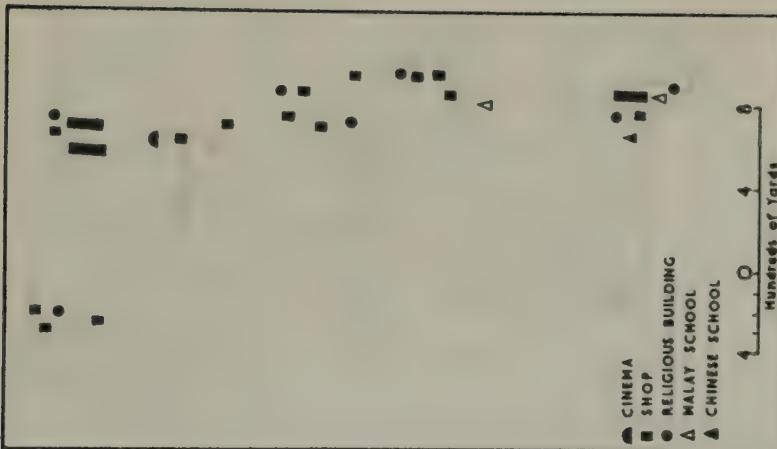


Plate 19. Mukim Four: points of Assembly.  
 (There are none elsewhere in the Mukim).





Plate 20. The spatial relations of houses and fields in part of Permatang Janggu Village.



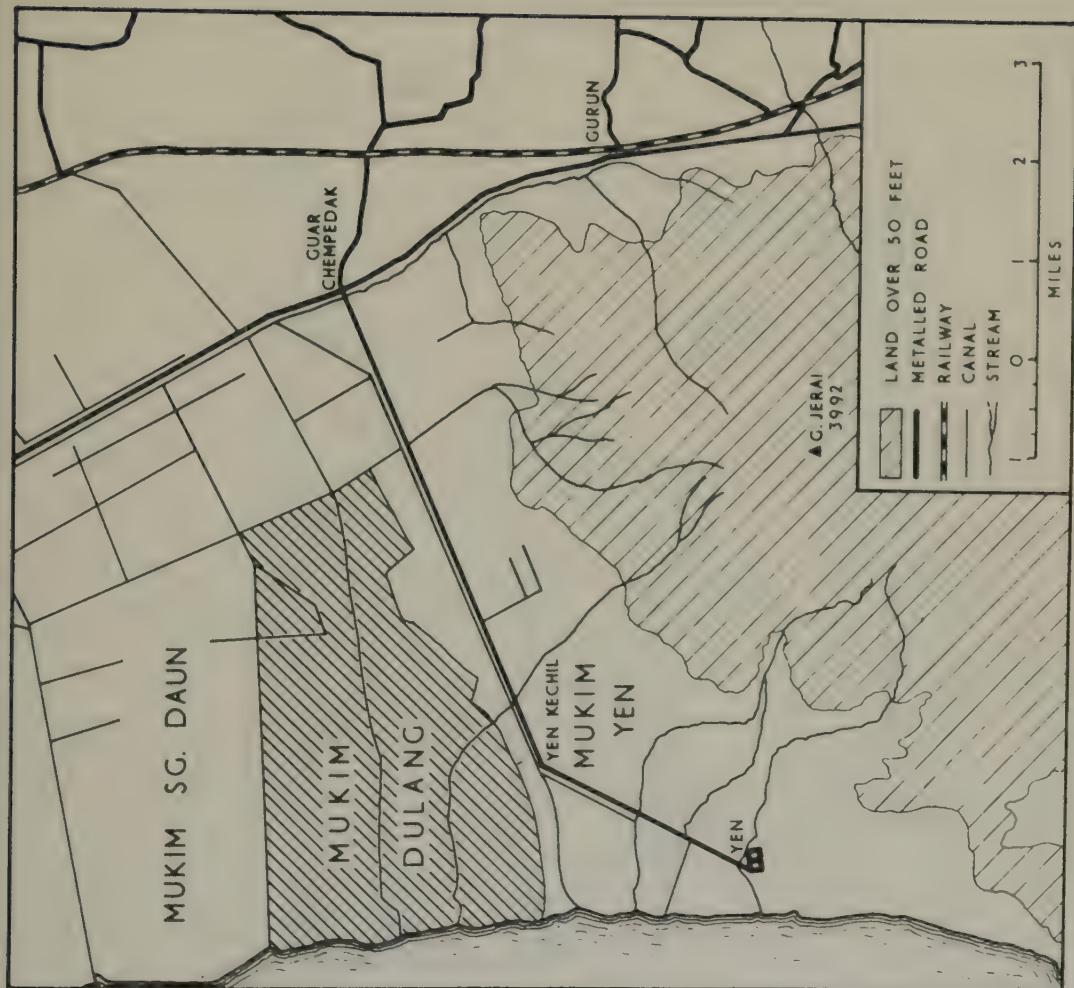


Plate 21. The position of Mukim Dulang in Kedah.



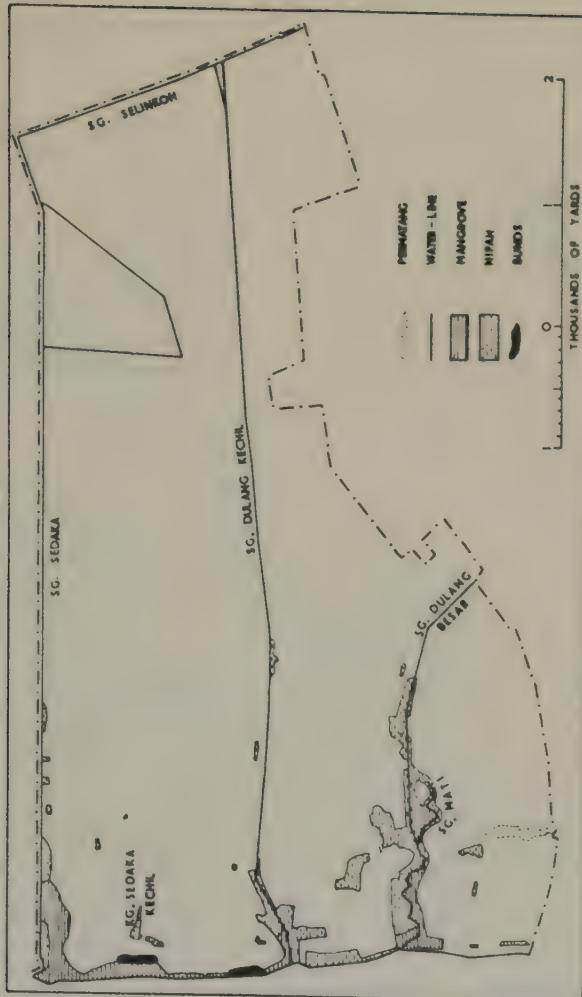


Plate 22. Mukim Dulang: natural vegetation and main drainage-lines.



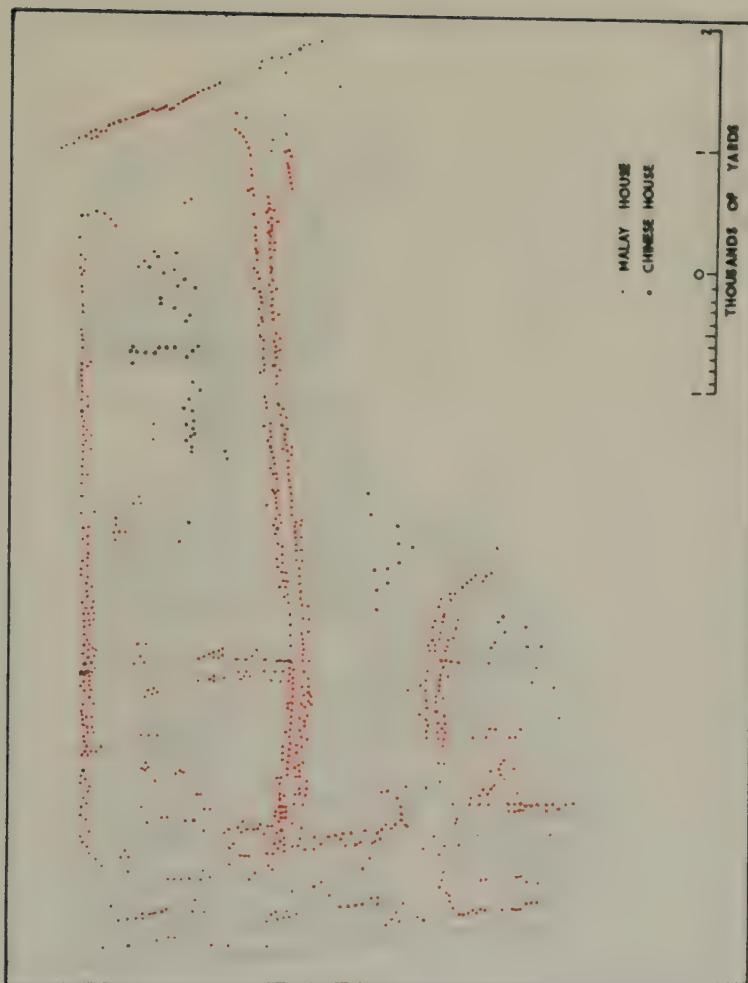


Plate 23. Mukim Dulang: distribution of houses. Each dot represents one house.



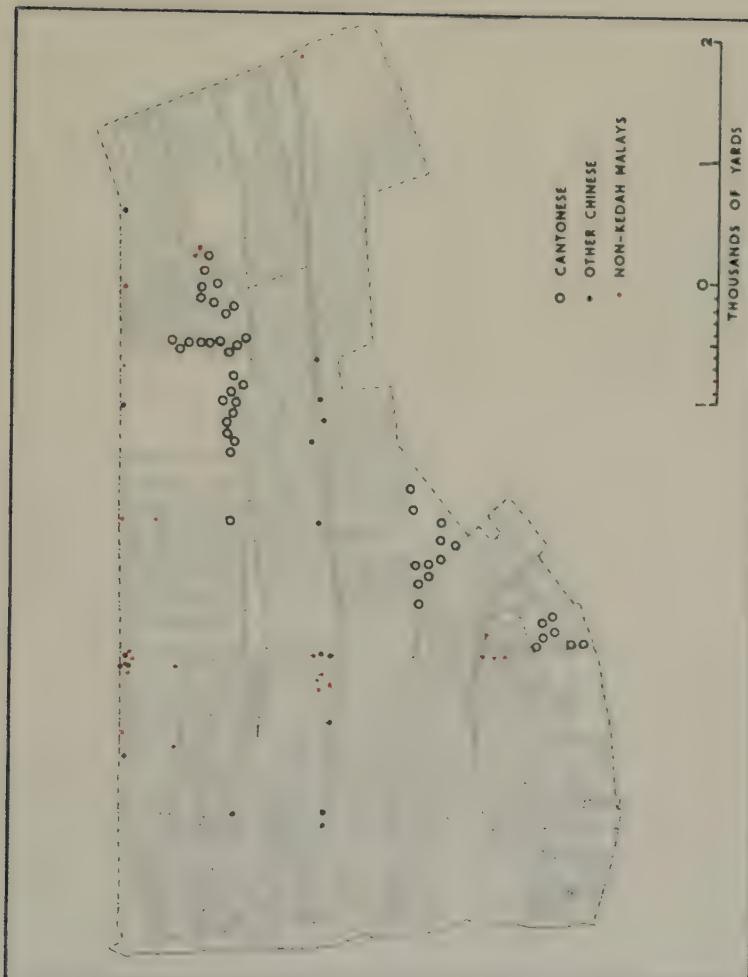


Plate 24. Mukim Dulang: distribution of households of other than Kedah Malays.



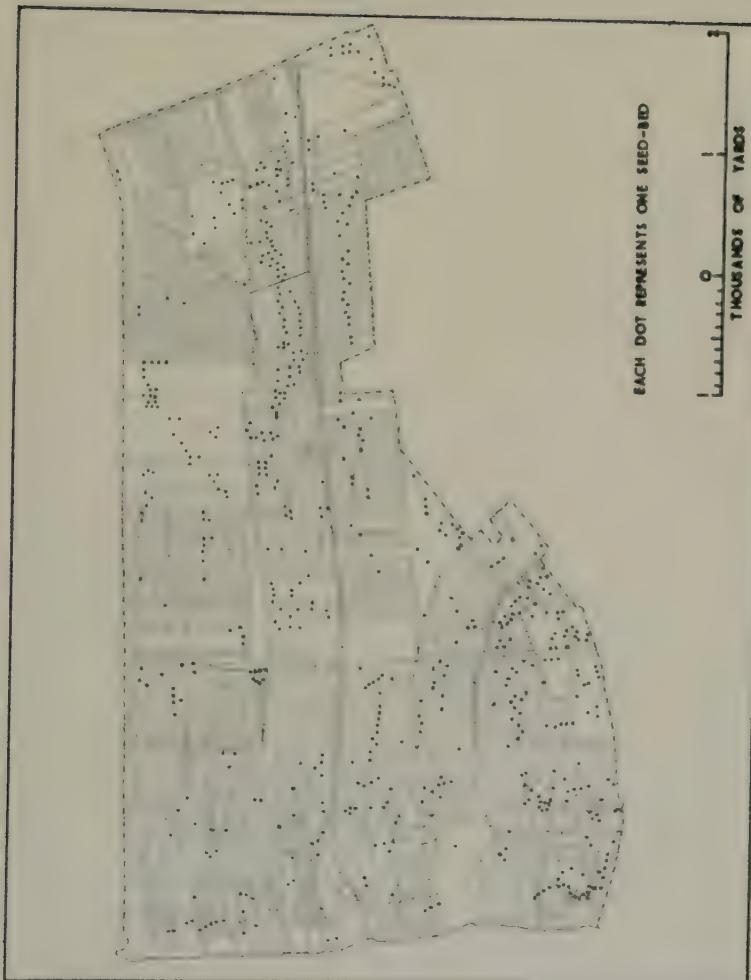


Plate 25. Mukim Dulang: positions of seed-beds in July 1954. Note the contrast between this distribution and that of houses in Plate 23.



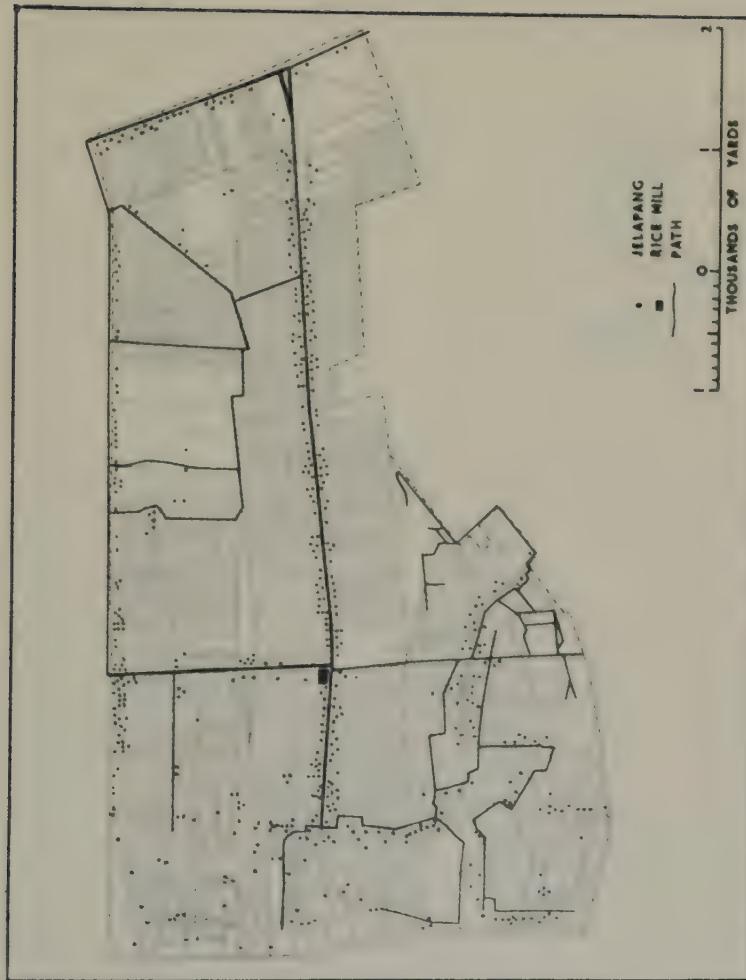


Plate 26. Mukim Dulang: distribution of *jelapangs*. Note the central position of the rice-mill.



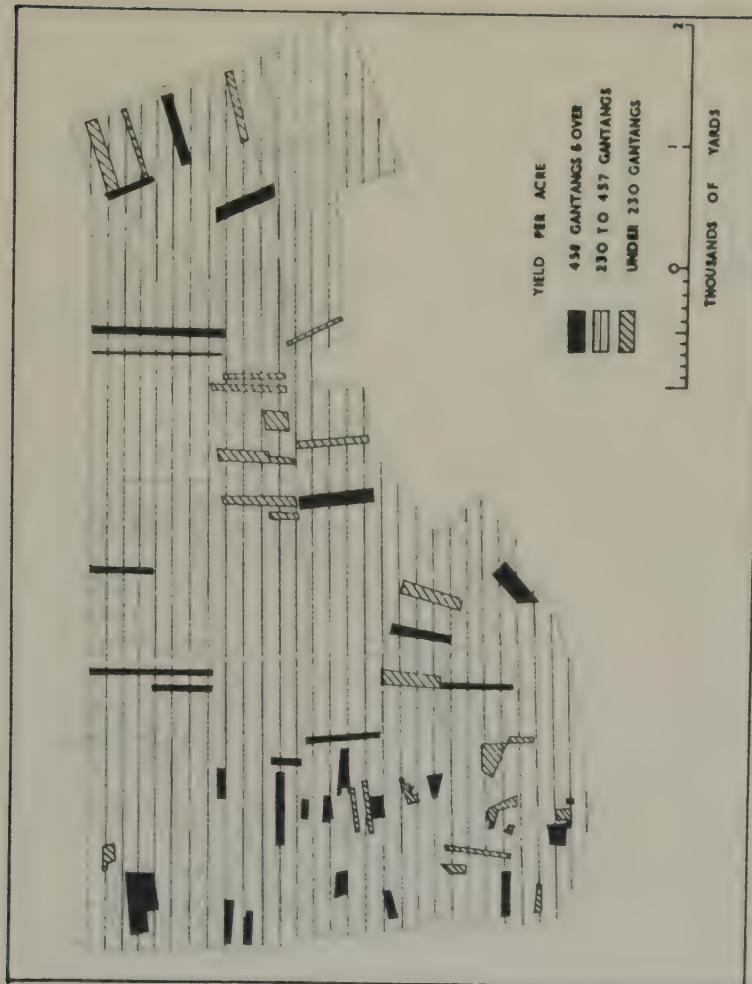


Plate 27. Mukim Dulang: padi yields.



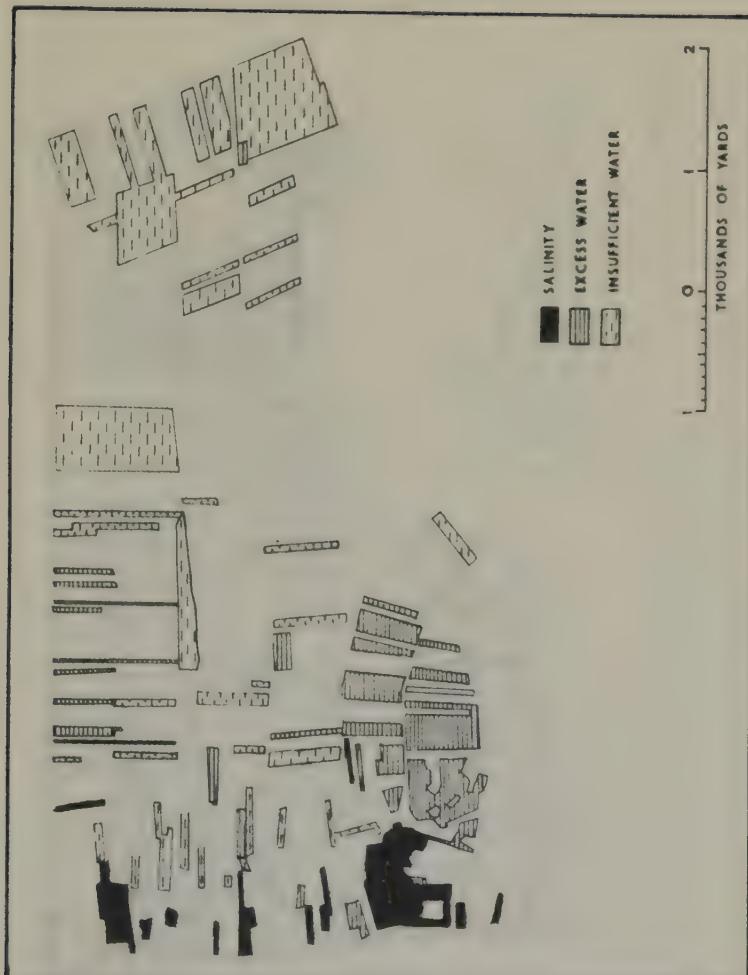


Plate 28. Mukim Dulang: factors affecting padi yields.





Plate 29. Mukim Dulang: land use



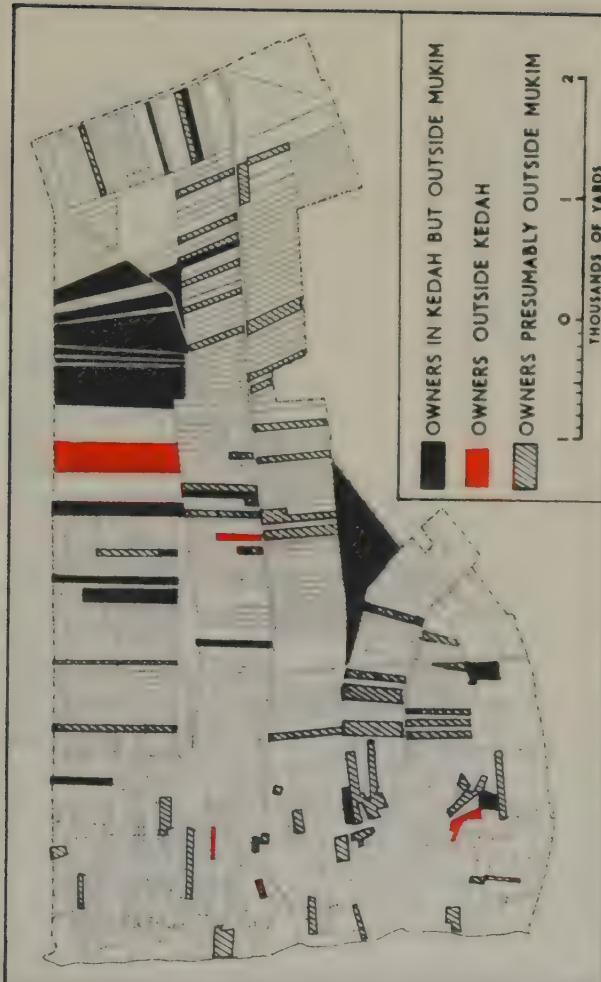


Plate 30. Mukim Dulang: the place of residence of each lot owner. The unshaded area includes lots whose owners were living in adjacent mukims in July 1954 or for whom no information was available.





Plate 31. Mukim Duang: the tenancy of lots owned by Malays. The term "Malay Worker" is applied to those lots where, though both worker and owner are of the Malay community, there is no evident kinship between them. The lots marked T.O.L. are held under Temporary Occupation Licences.



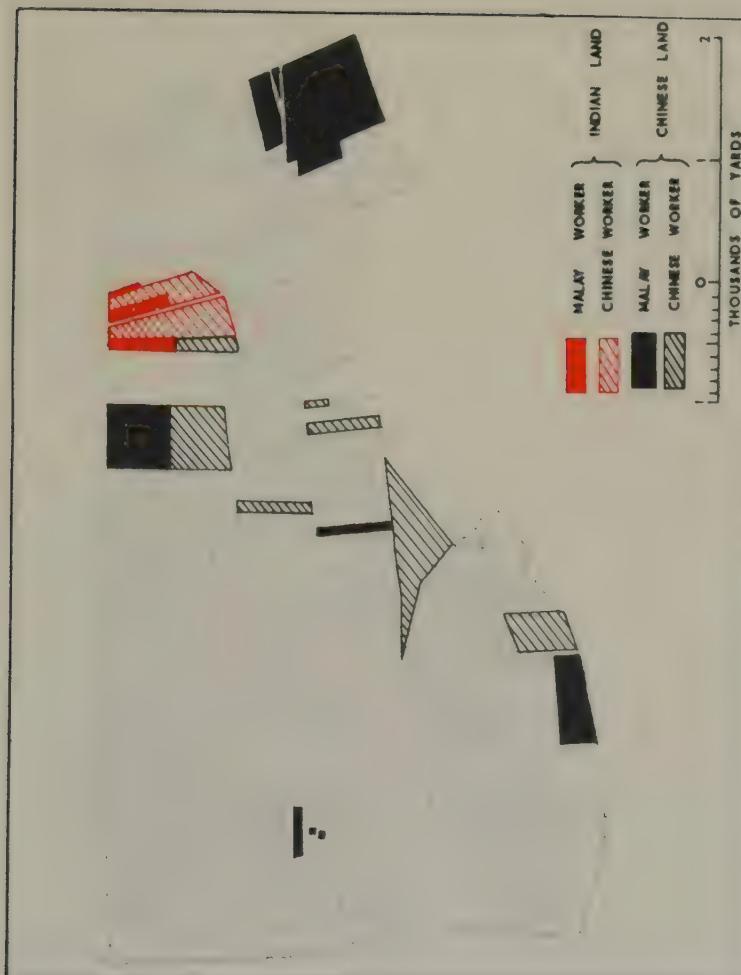


Plate 32. Mukim Dulang: the tenancy of lots owned by Chinese and Indians



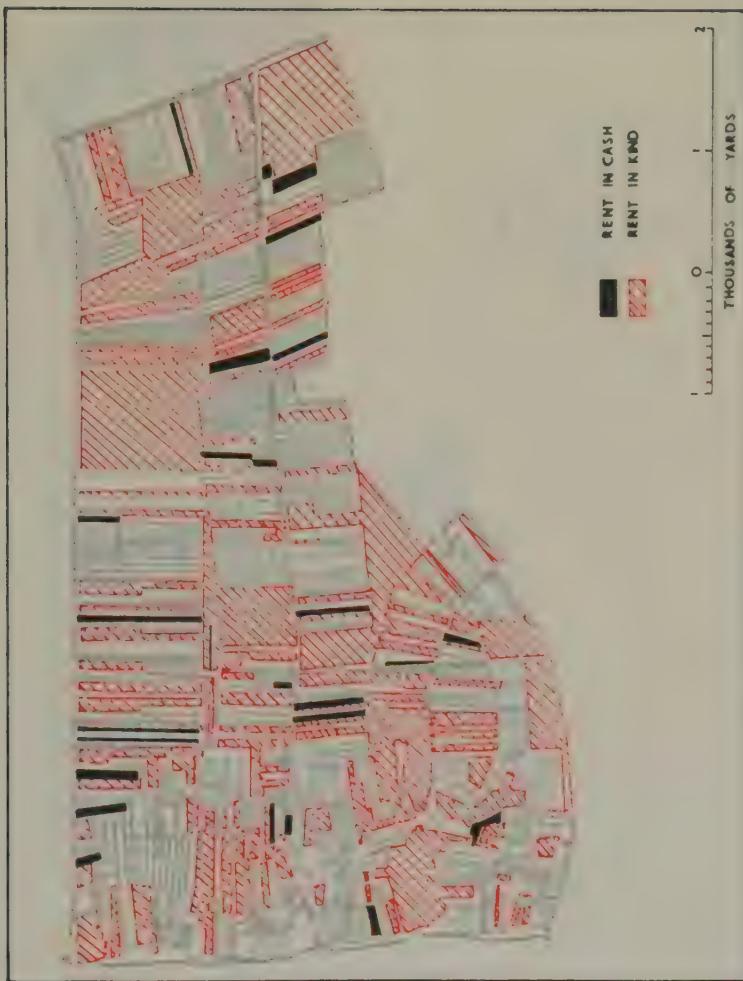


Plate 33. Mukim Dulang: payment of rent.





Plate 34. Mukim Dulang: last change of title for each lot according to the Mukim Land Register. No information was available for the unshaded lots.



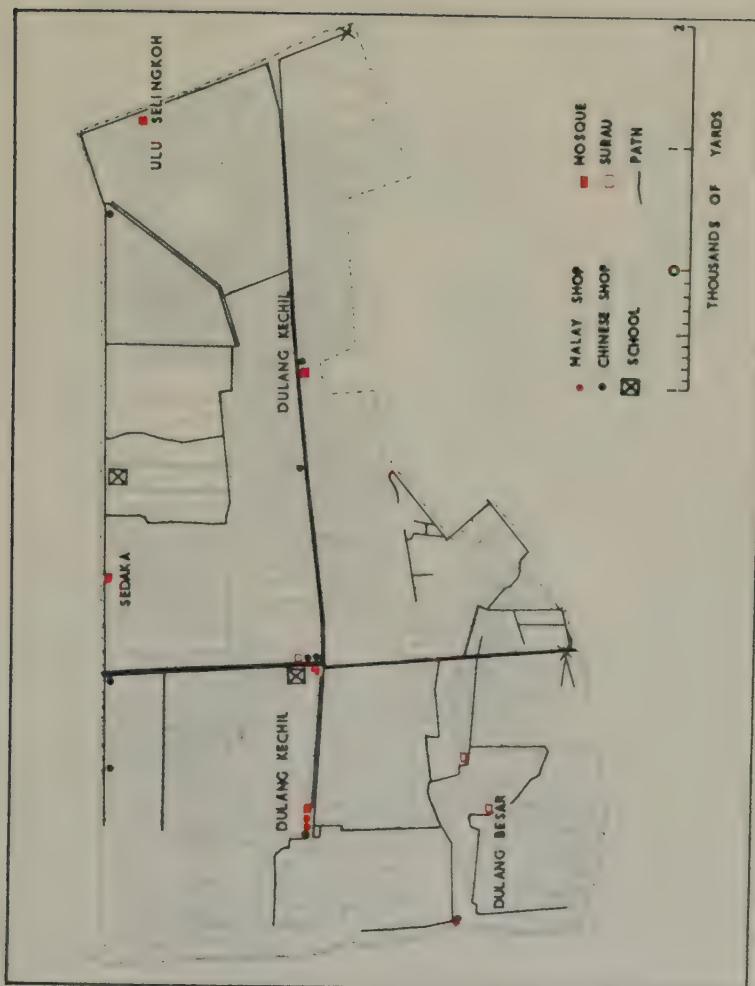


Plate 35. Mukim Dulang: footpaths and points of assembly.



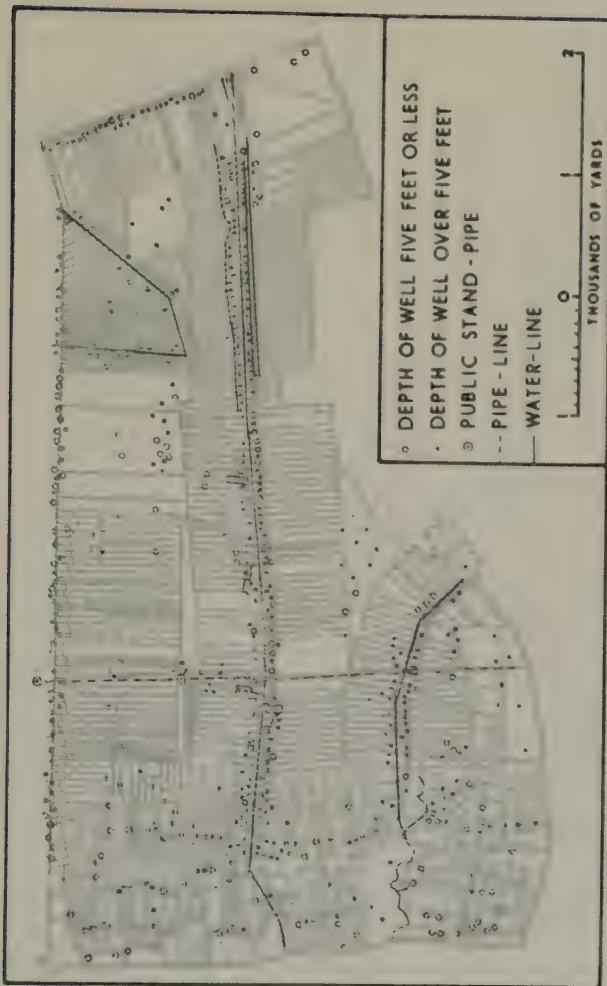


Plate 36. Mukim Dulang: distribution of wells and stand-pipes.



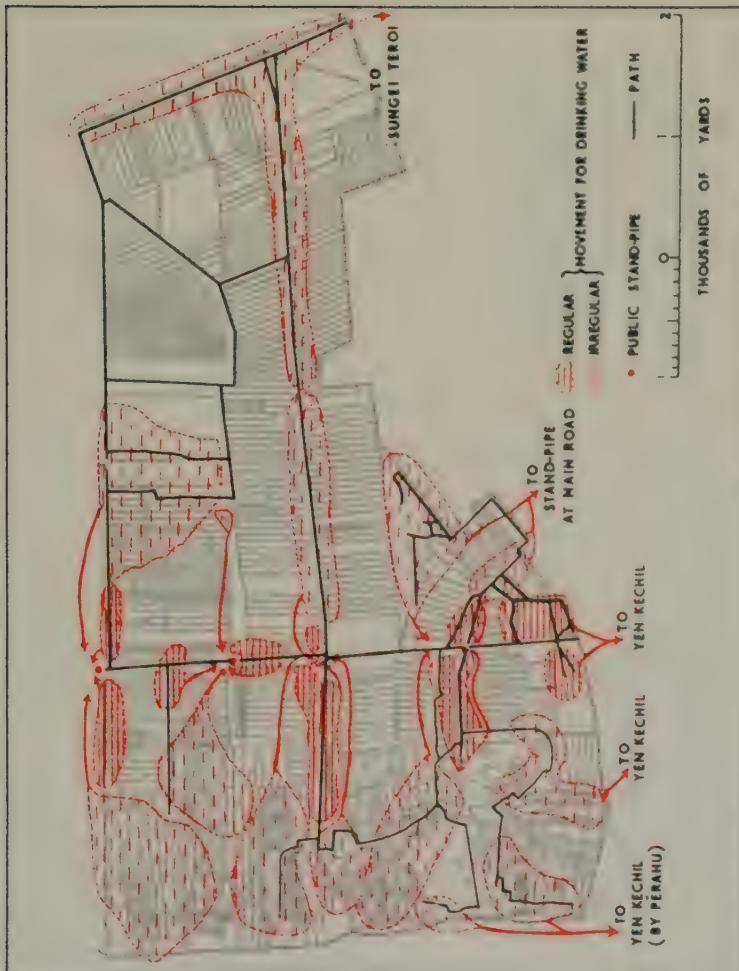


Plate 37. Mukim Dulang: movements for drinking-water.



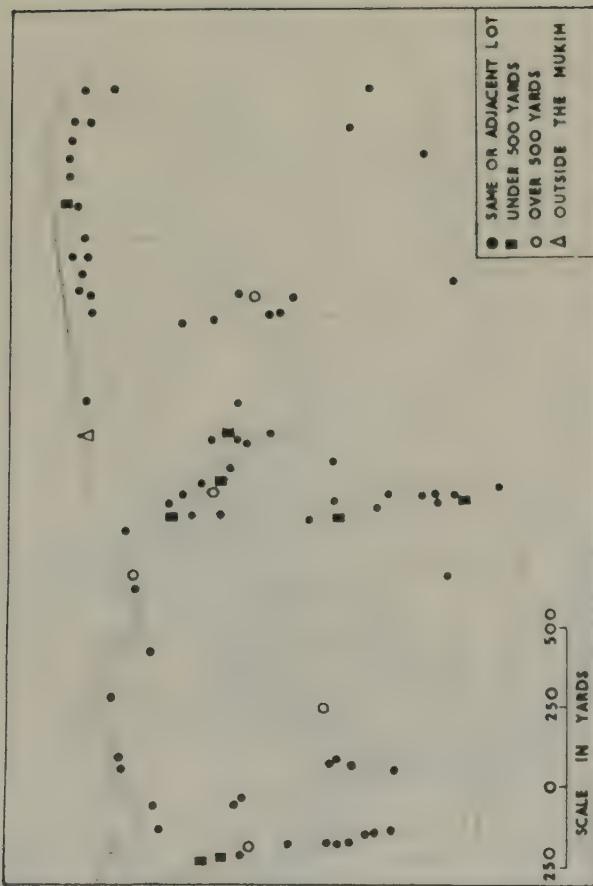
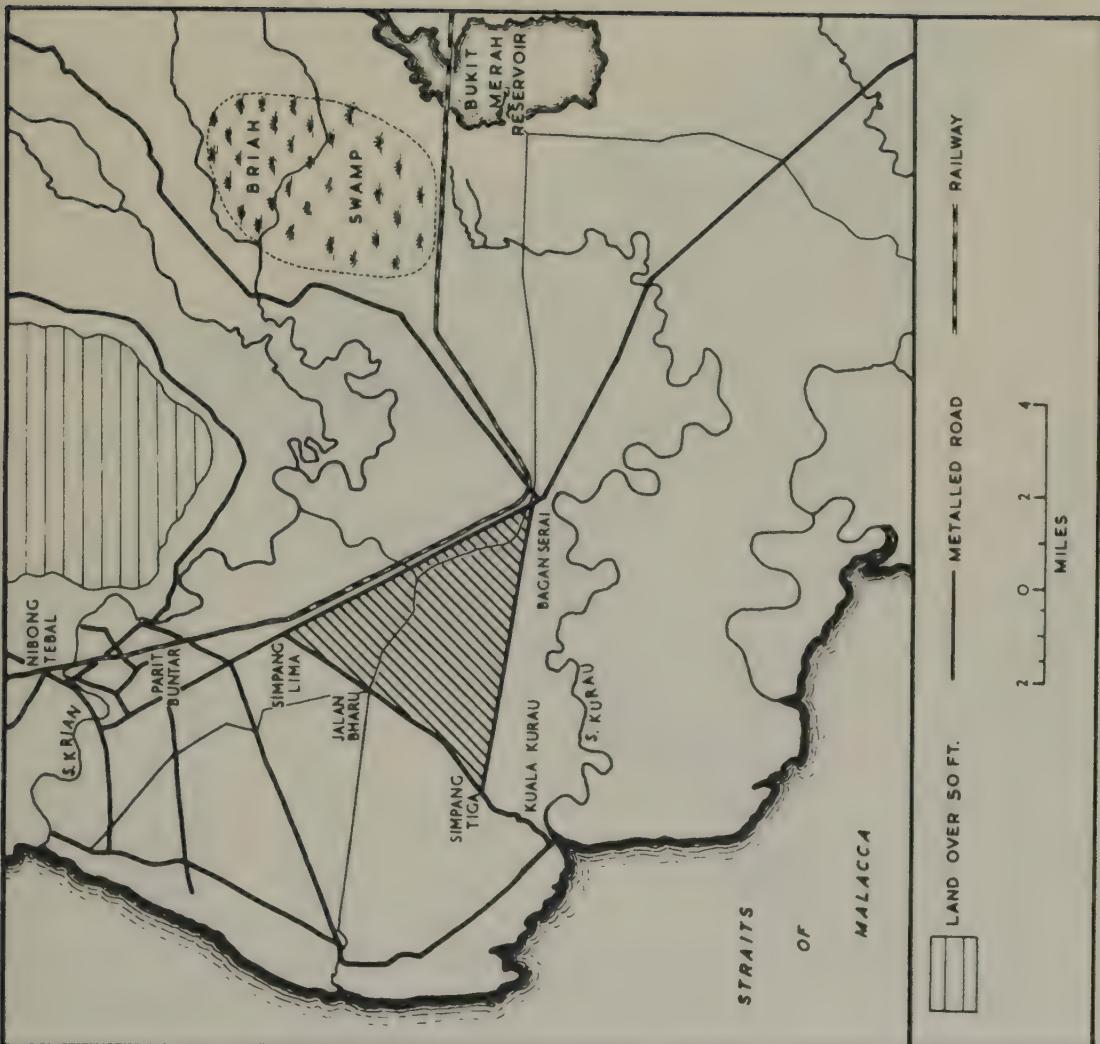


Plate 38. Mukim Dulang: detail of the south-western coastal area, showing the positions of houses in relation to worked fields.



Plate 39. The position of Bagan Serai triangle in Krian.





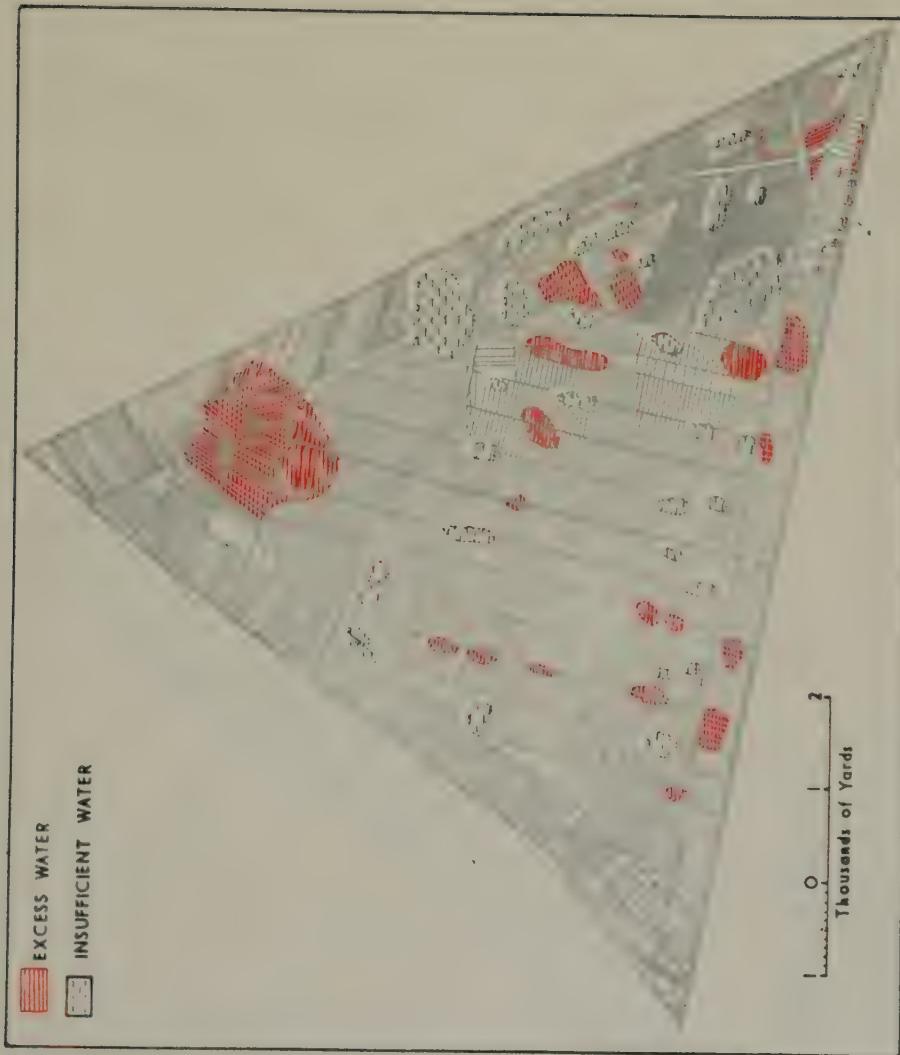


Plate 40. Bagan Sera triangle: excessive and insufficient water.



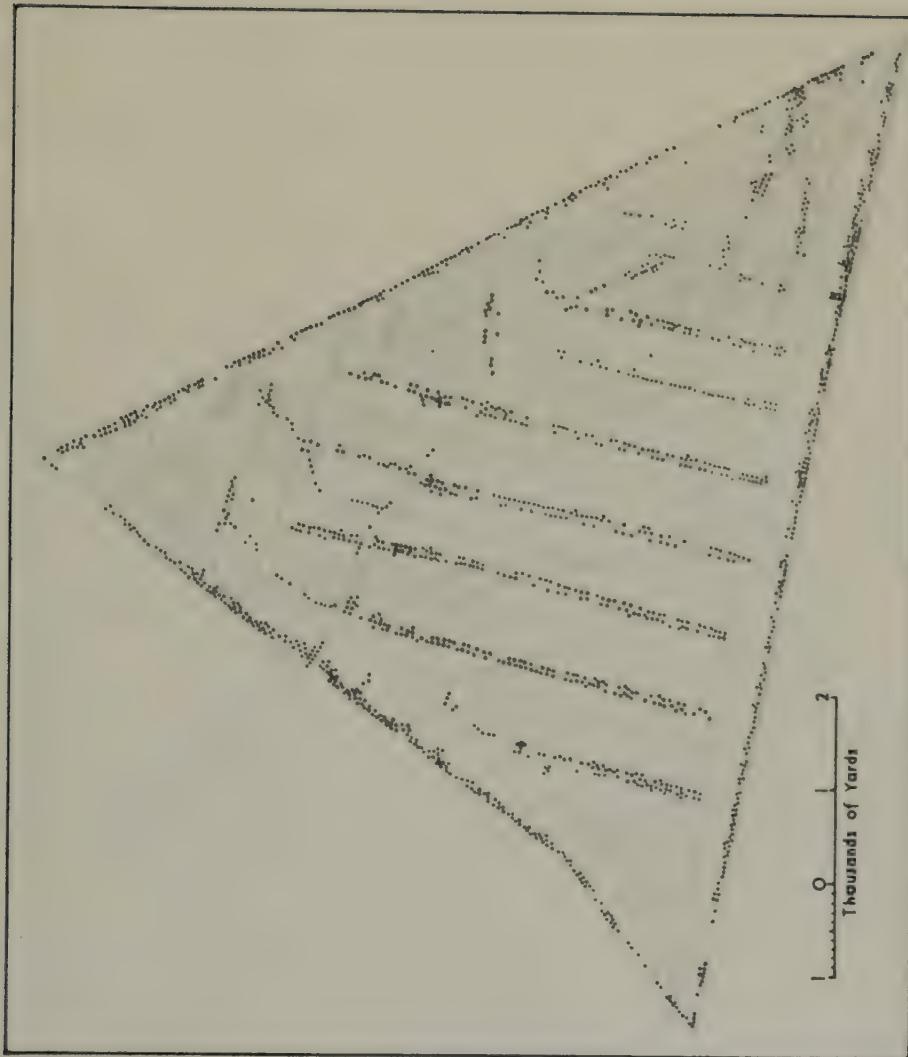


Plate 41. Ragan Syrai triangle: distribution of houses. Note (i) that only a few houses are situated along the main canal, and (ii) the lie of the lots



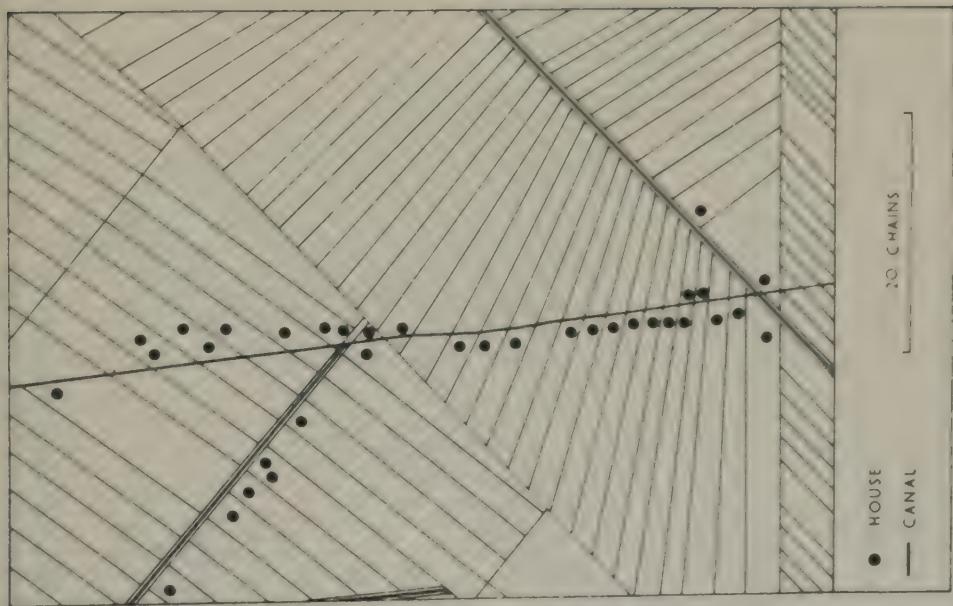


Plate 42. Detail from the north of Bagan Sri Lanka, showing houses sited along a part irrespective of lot shapes



• BANJARESE HOUSEHOLD  
◦ OTHER MALAY HOUSEHOLD

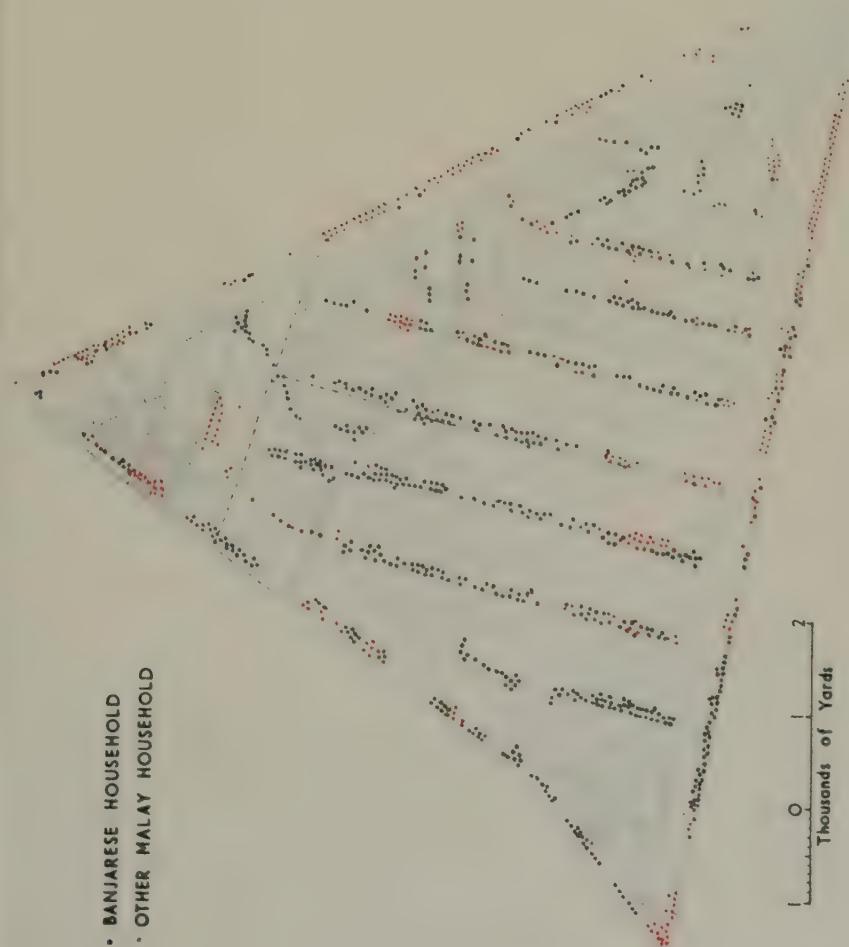


Plate 43. Bagan Sērai triangle: distribution of Malay and Banjarese households.



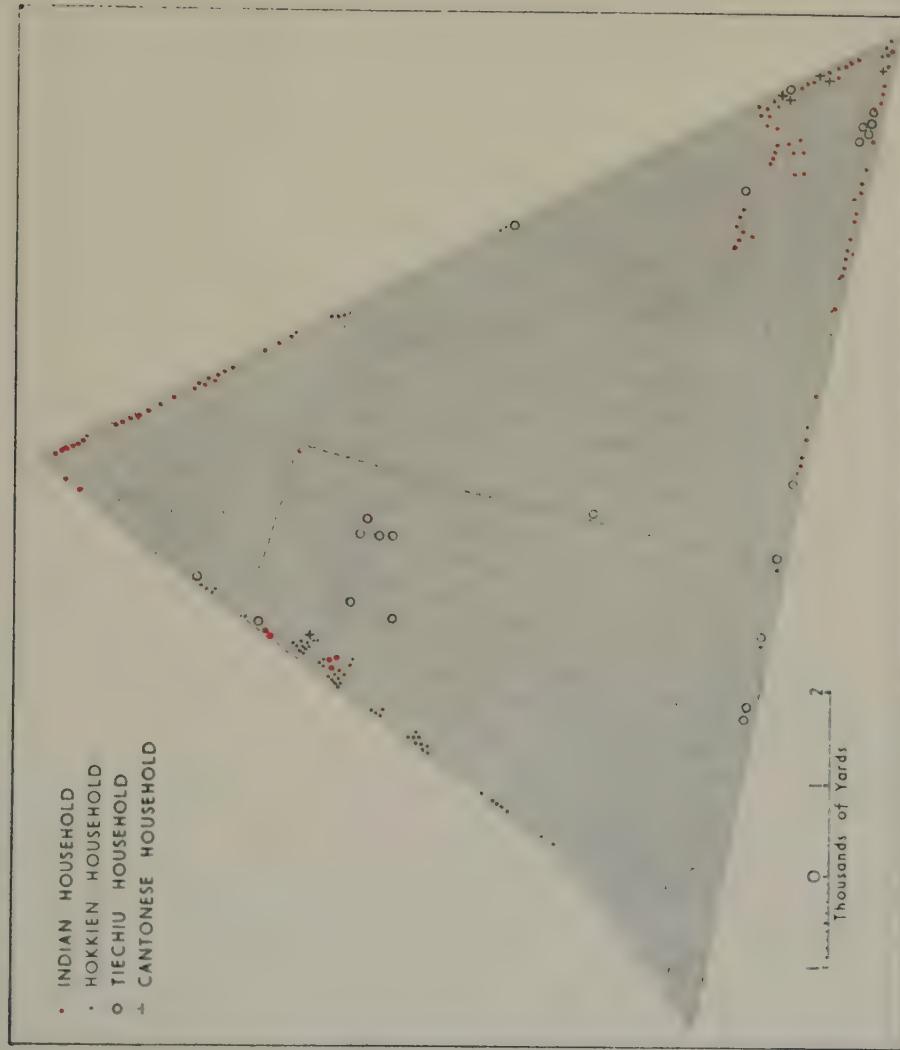


Plate 44. Bagan Serai triangle: distribution of Indian and Chinese households.



• PADI STORE  
■ RICE MILL

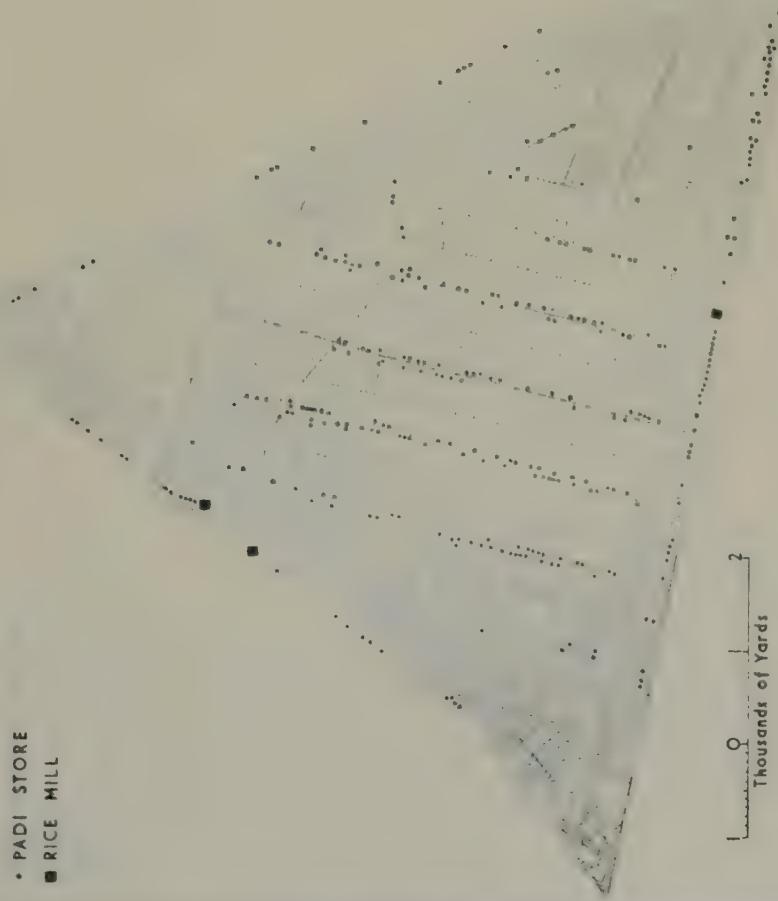


Plate 45. Bagan Sriai triangle: distribution of *jatipungs* and rice-mills.



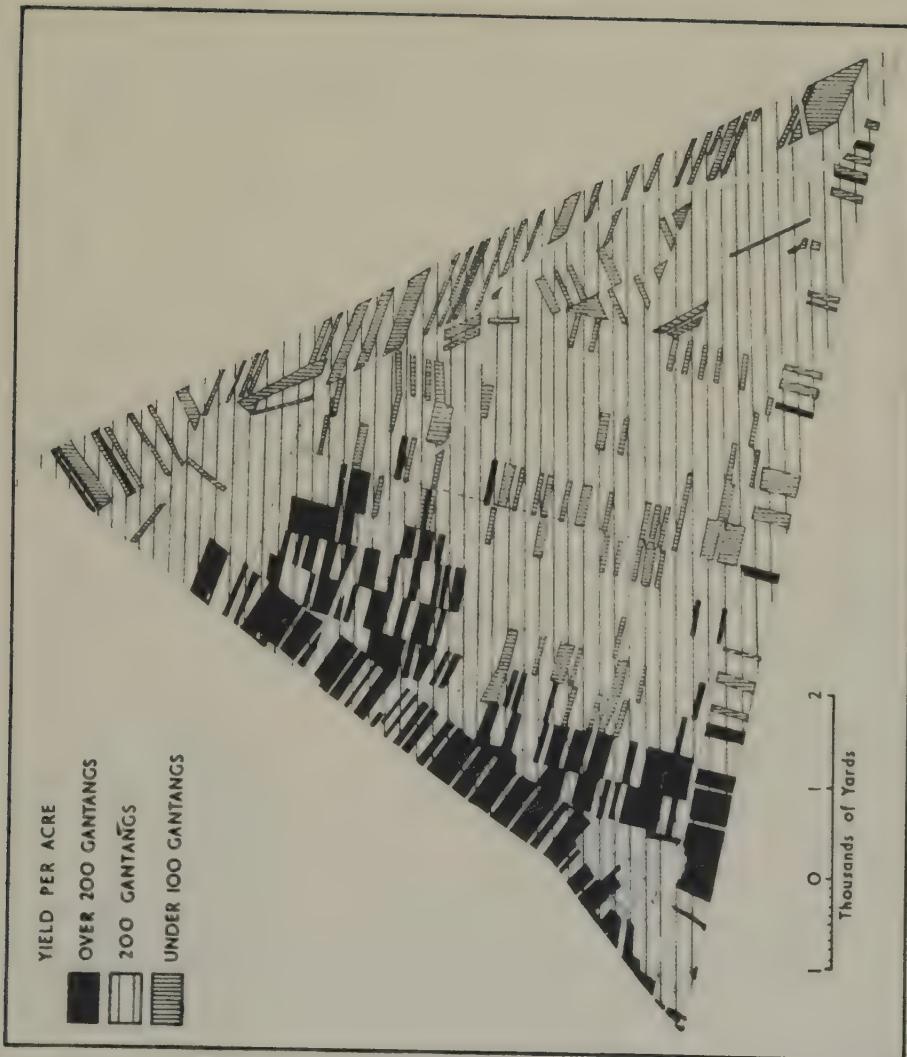


Plate 46. Bagan Srai triangle: padi yields.



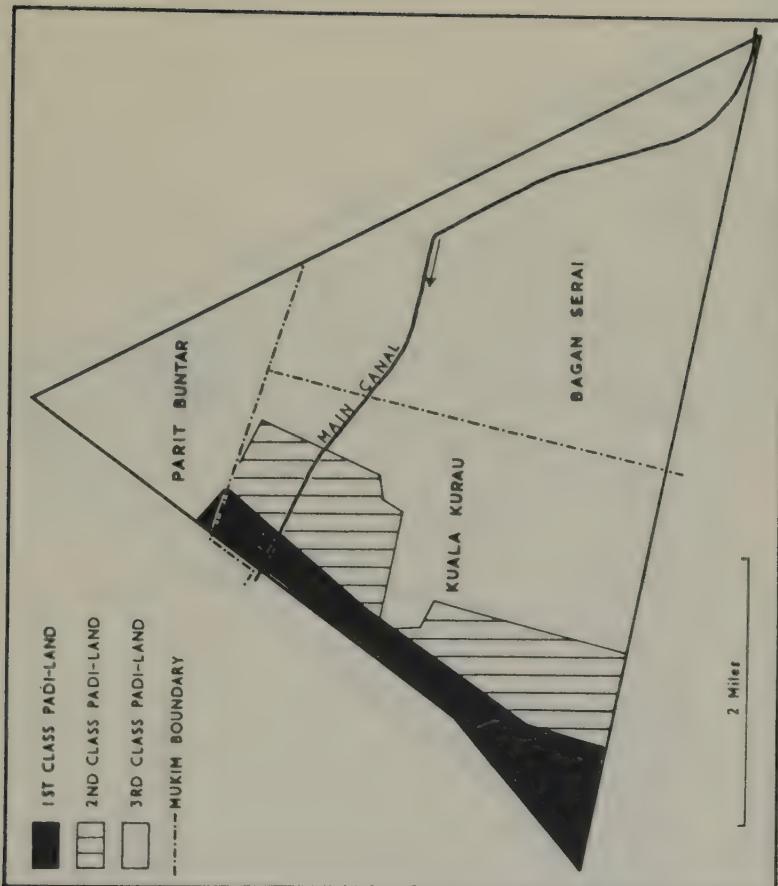


Plate 47. Bagan Serai triangle: the official classification of padi-land.



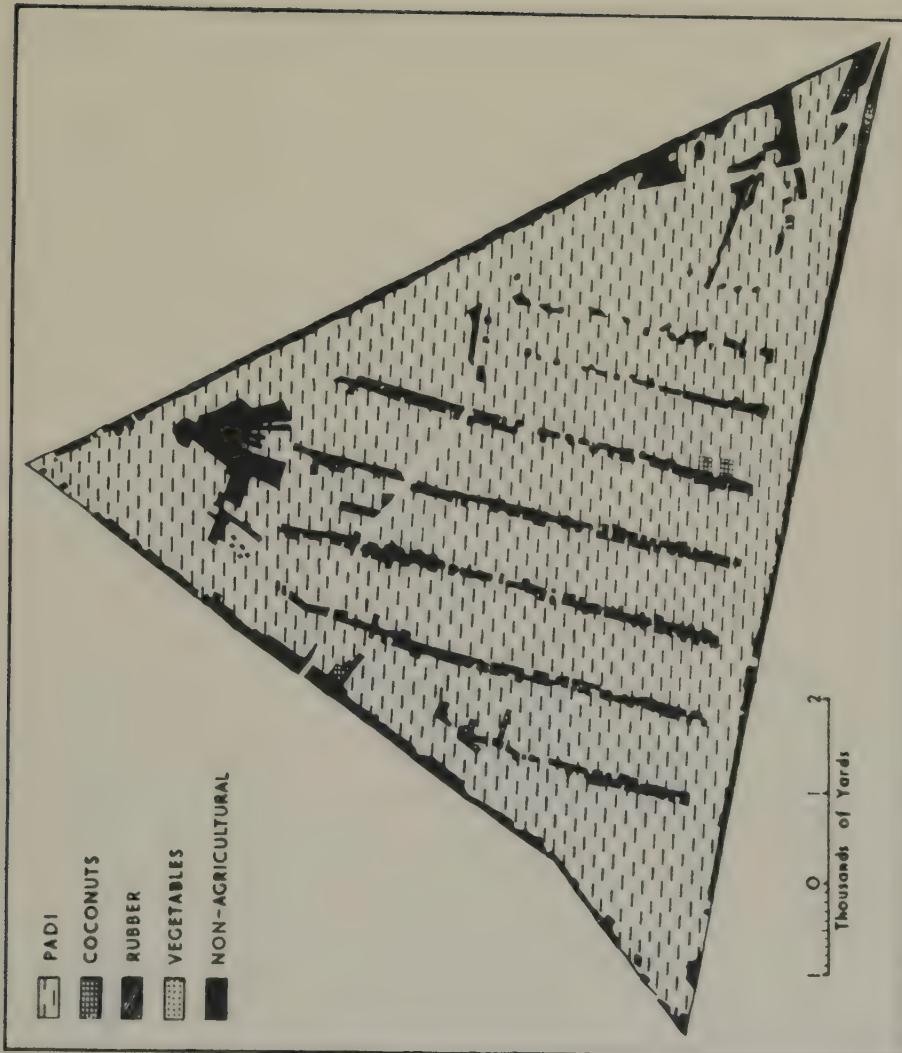


Plate 48, Bagan Skrai triangle: land use. The non-agricultural land comprises both kampong and waste land.



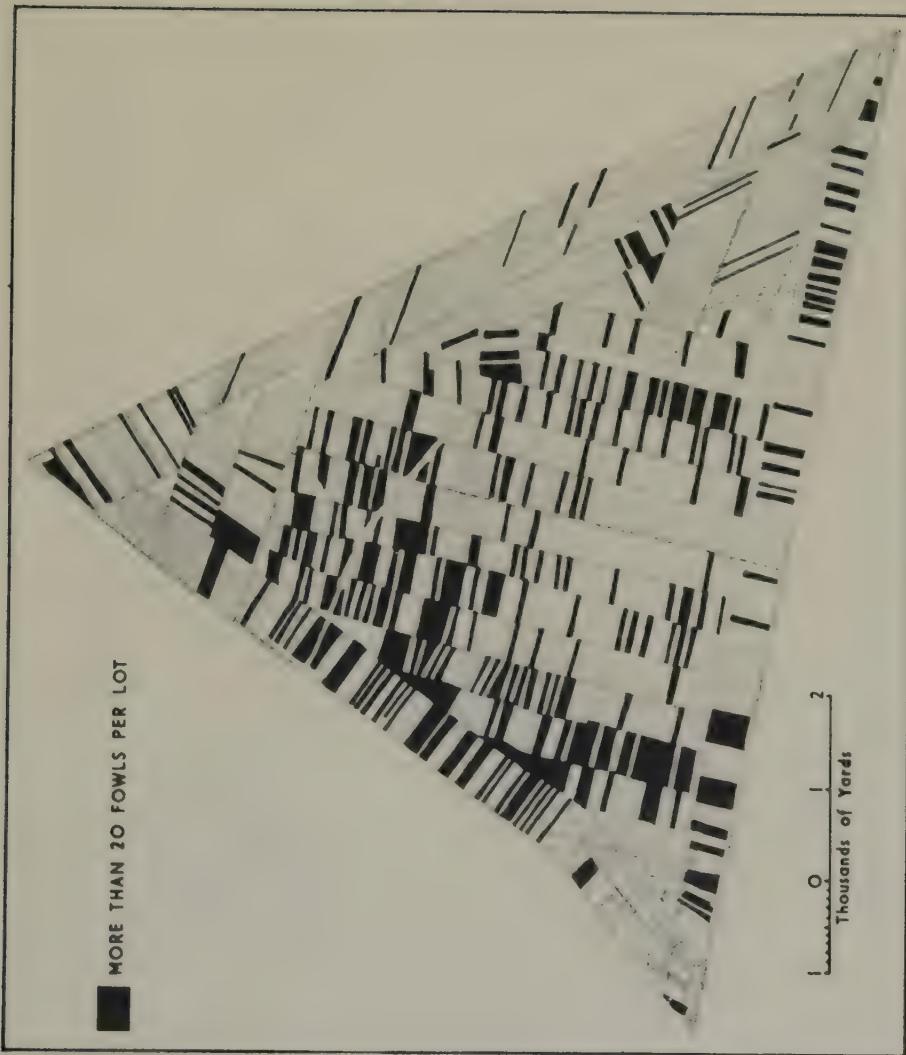


Plate 49. Bagan Srirai triangle: lots with more than twenty fowls.



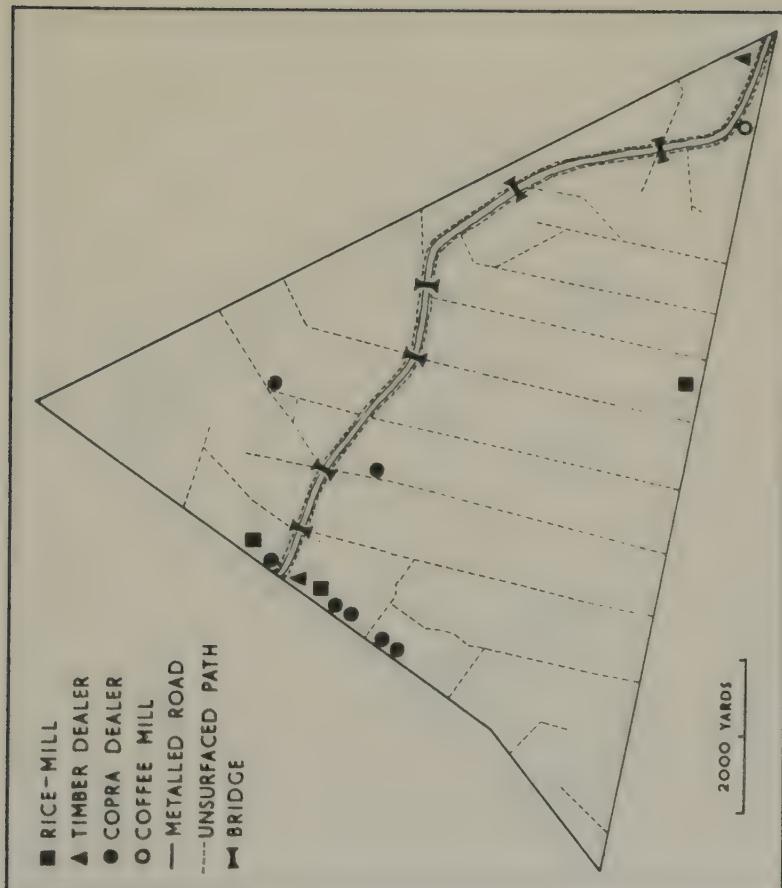


Plate 50. Bagan Srirai triangle: rice-mills, dealers and lines of movement.



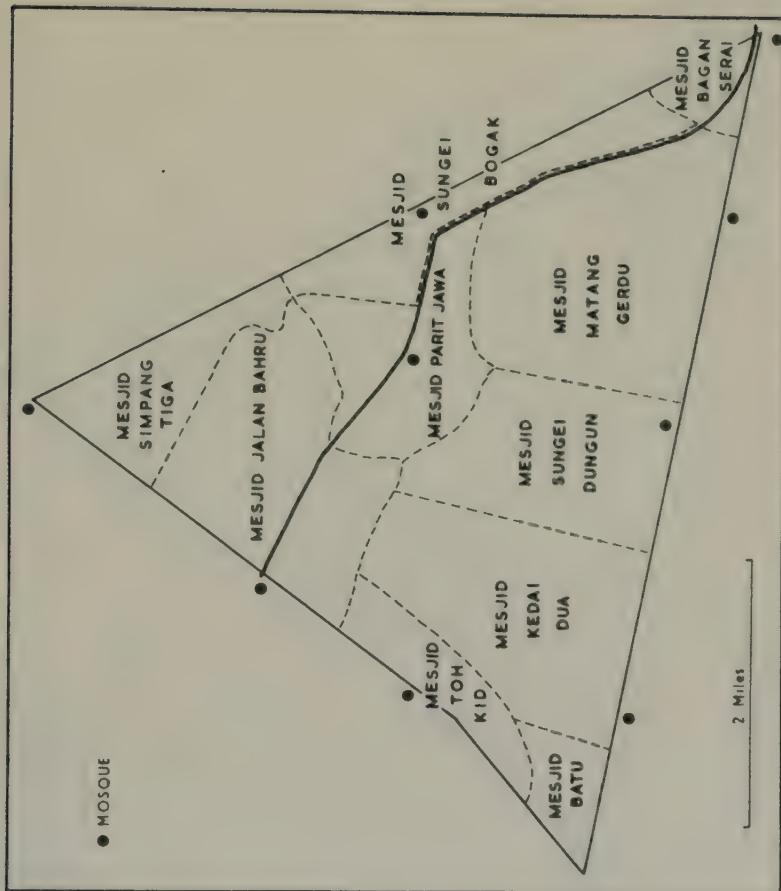


Plate 51. Bagan Serai triangle: religious districts.





Plate 52. Bagan Sarai triangle: social buildings. All the shops are Chinese, except the one marked  $M$ , which is owned by a Malay.



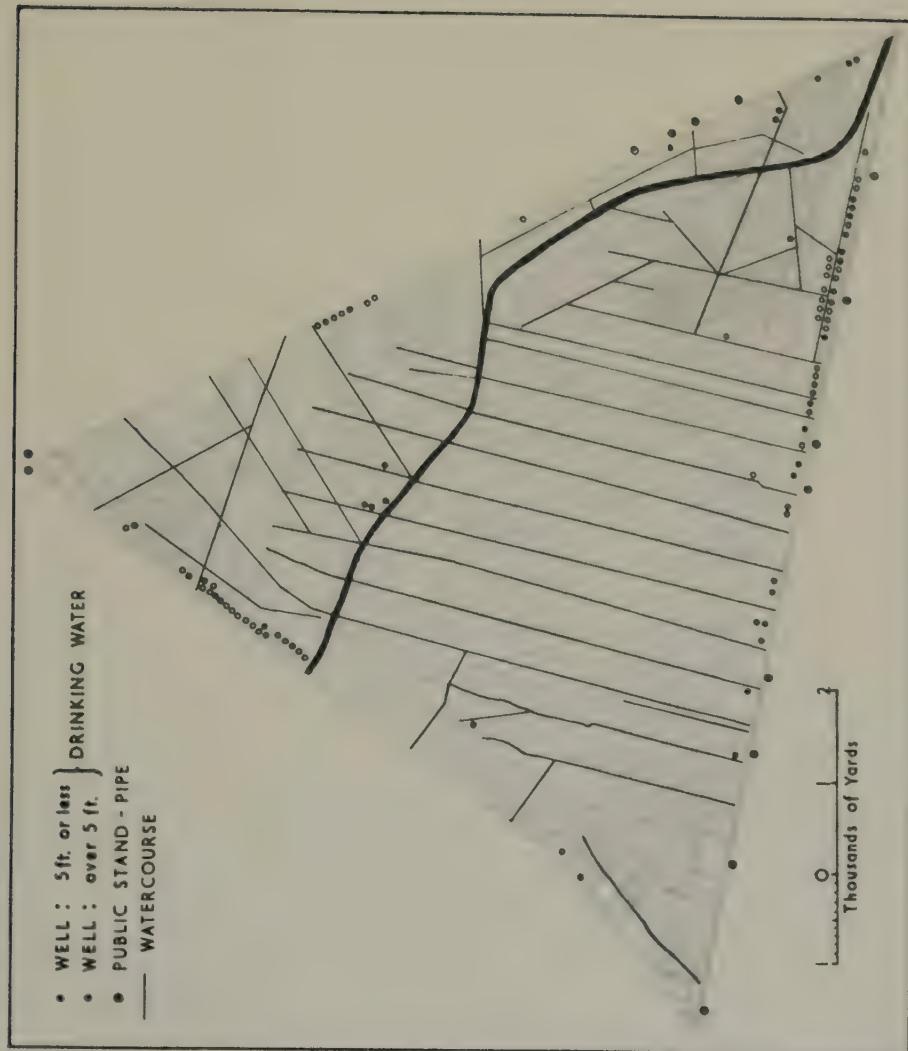


Plate 53. Bagan Serai triangle: distribution of wells and stand-pipes.



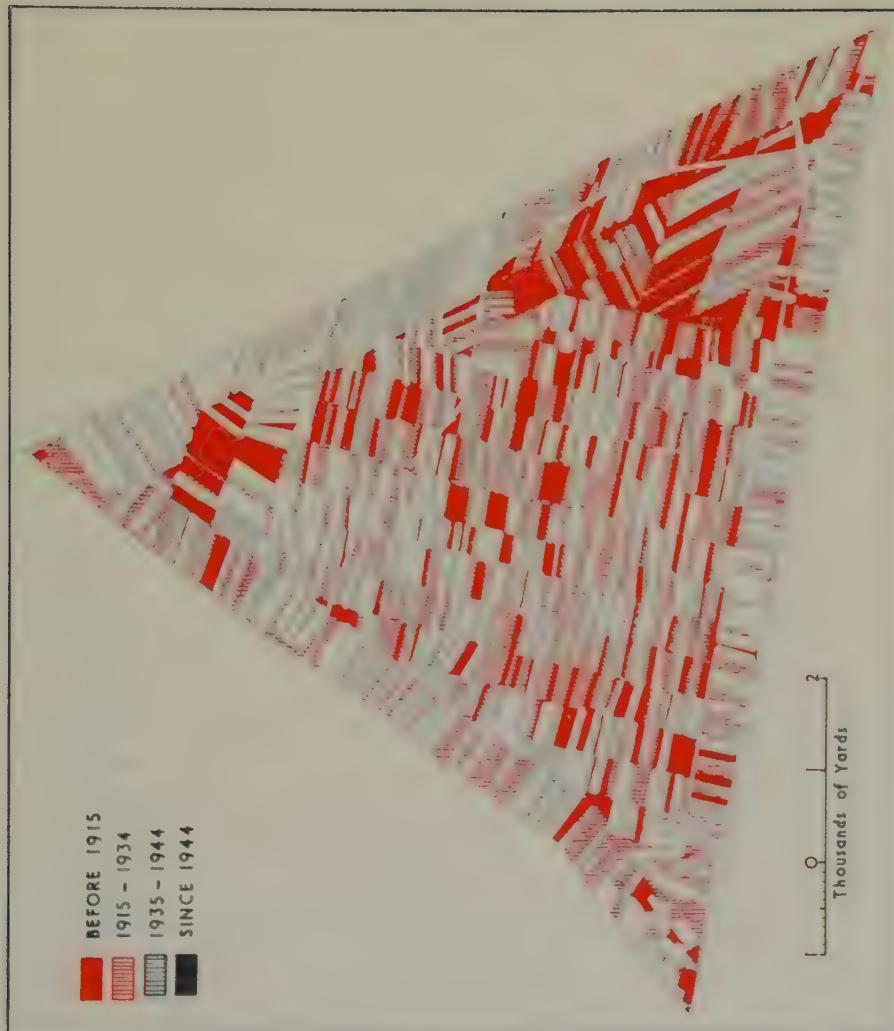


Plate 54. Bagan Serai triangle: the last change of title for each lot according to the Mukim Land Register.



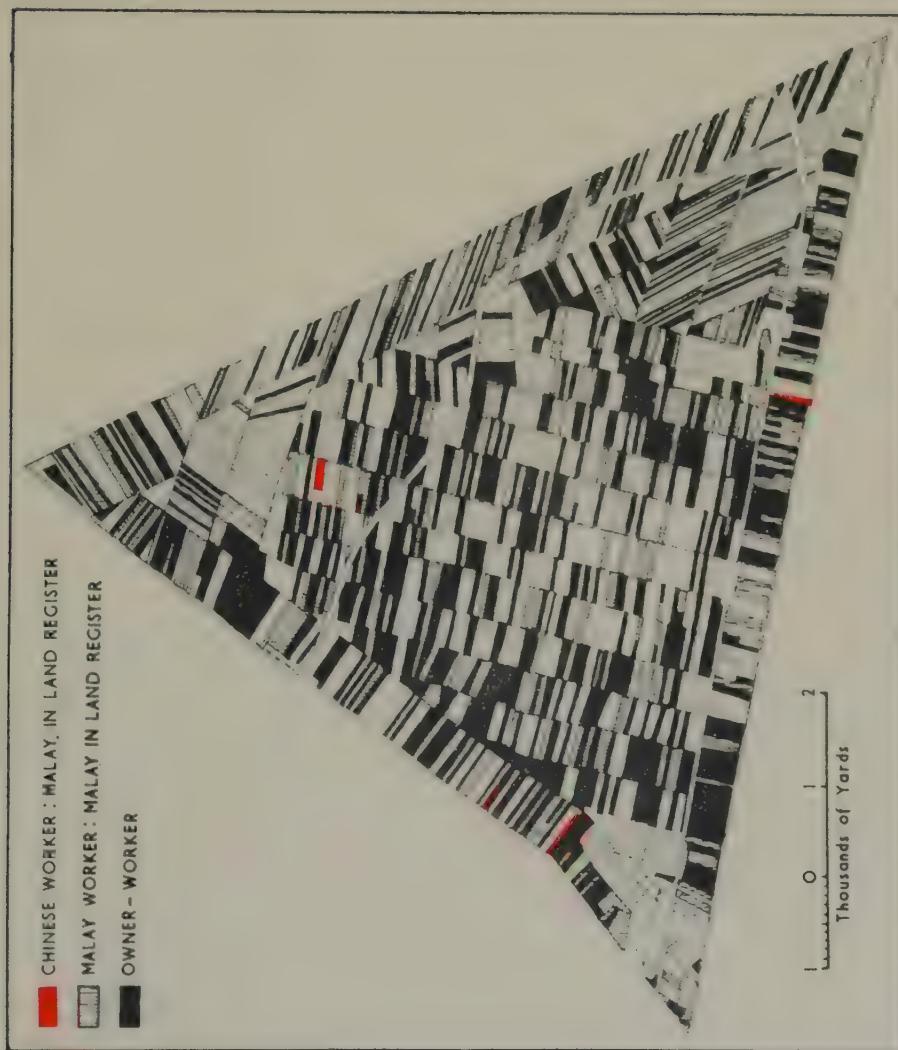


Plate 55. Bugan Serai triangle: the tenantry of lots owned by Malays.



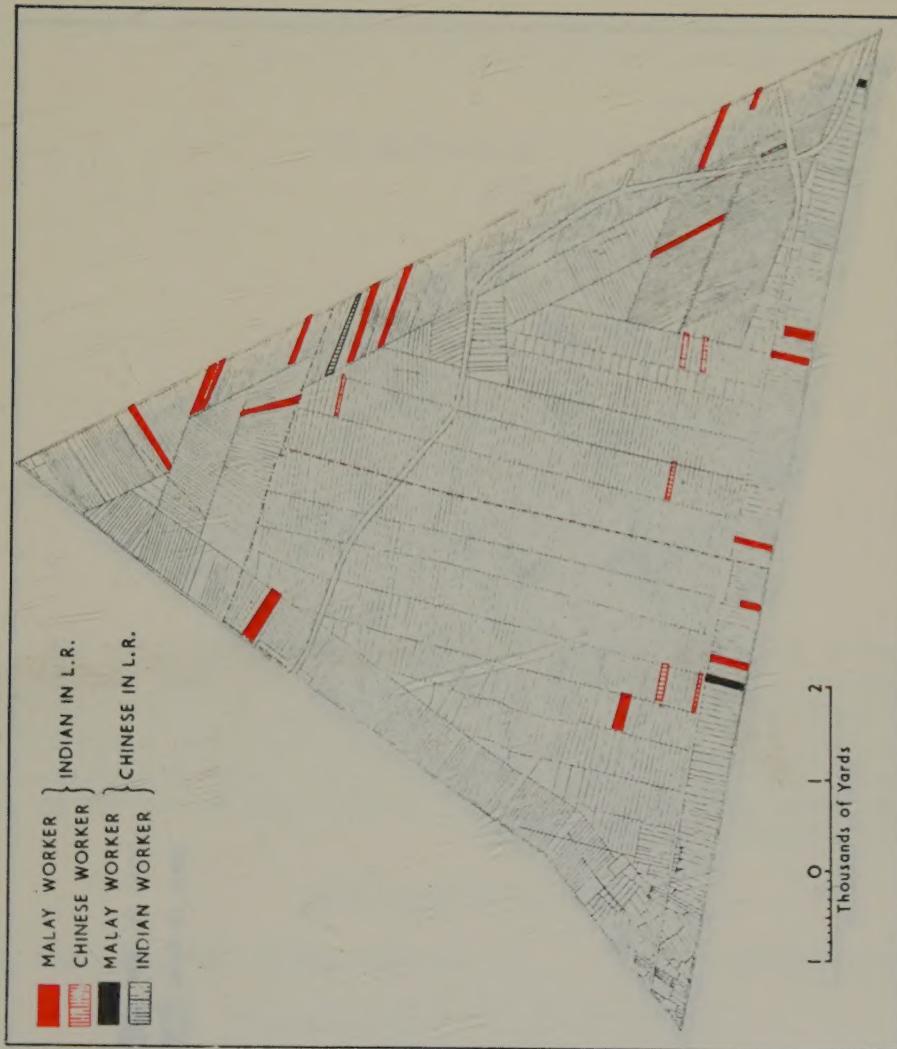


Plate 56. Bagan Serai triangle: the tenantry of lots owned by Indians and Chinese.  
 L.R. = Land Register.



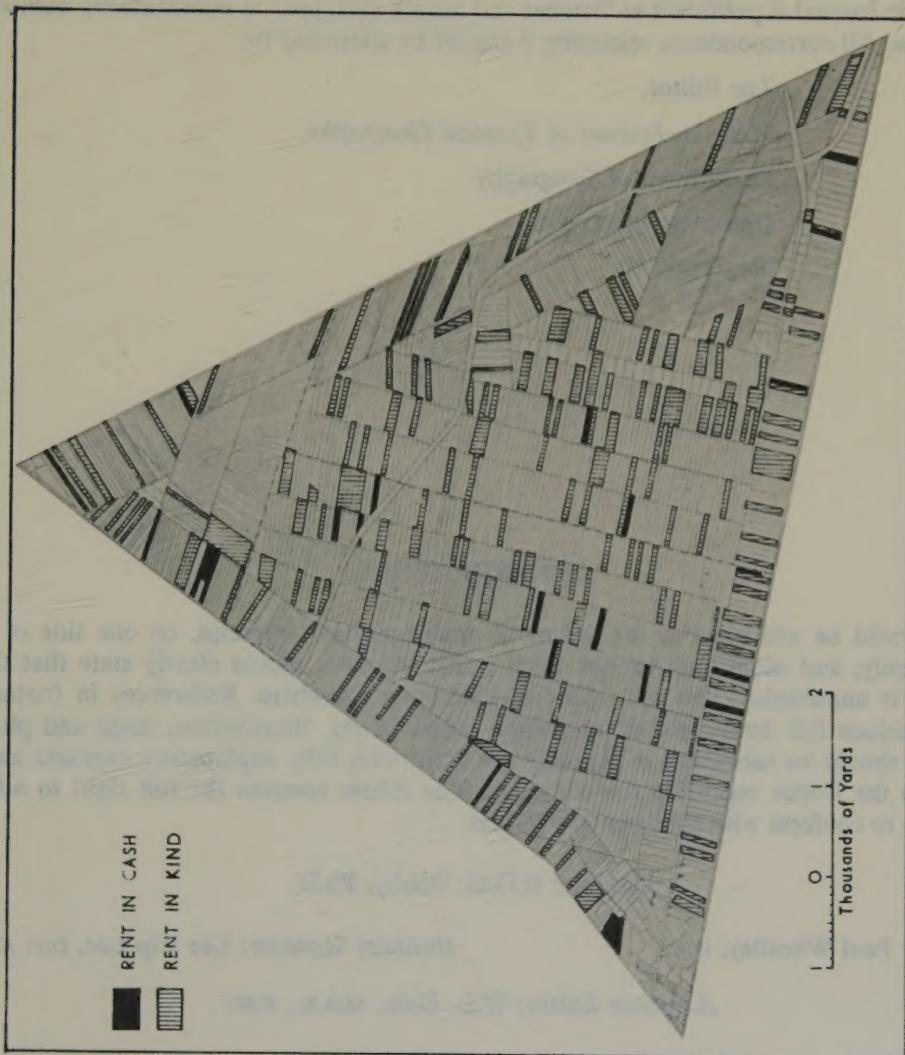


Plate 57. Bagan S̄krai triangle: payment of rent.

## MALAYAN JOURNAL OF TROPICAL GEOGRAPHY

The Journal is published in October and March each year as consecutively numbered volumes. All correspondence regarding it should be addressed to:

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### CONTRIBUTIONS

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